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THE
TRANSLATION INTO ENGLISH
OF THE
PRINCIPAL REFERENCES
TO THE
SIXTY-SIX ANATOMICAL PLATES
OF THE
LATIN EDITION
OF
SCHOLA MEDICINÆ UNIVERSALIS NOVA,
OR, THE
NEW UNIVERSAL SCHOOL OF MEDICINE.



BY WILLIAM ROWLEY, M.D.

Member of the University of Oxford, the Royal College of Physicians in London, Physician to the St. Mary-le-bone
Infirmary, Author of the Rational and Improved Practice of Physic, &c. &c

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TRANSFORMATION INTO INDIAN

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TRANSLATION, &c.

TO obviate many defects in medical education, to promote the acquisition of medical science with greater facility, to render the principles and practice of medicine less conjectural, and to diffuse its excellent and humane benefits through all the earth, were the exciting motives, that strenuously impelled the author to write *Schola Medicinæ Universalis Nova* in Latin.

The principal impediments to useful medical studies, it appeared from close inspection and much reflection, were the multiplicity of authors, the variety of dubious systems, and the contrariety of opinions with which medicine superabounded. Professors formerly made a great display of apparent erudition by diffusive lectures, redundant in words and speculations, parsimonious in matters of fact and absolute truths. This conduct in the teachers bewildered the understandings of the scholars; the former taught, and the latter imbibed prejudices from which they could never emancipate themselves through life: the destruction, instead of the preservation of the human species, have frequently been the consequence. Medicine, that divinest of arts! under such circumstances, became often a pestilential scourge instead of a blessing to human society, and yet, whoever dared to attempt improvement, or laudably endeavoured to produce a reformation, was certain of inevitable ruin for his temerity: for every innovator, however meritorious, was accounted rash; but every assentor to opinions, and supporter of common doctrines, was considered prudent, wise, and learned. The examples of punishment for the greatest exertions of human skill and industry have deterred many excellent men from delivering to society the honest fruits of their labours, and mankind, by these means, have been deprived of several useful discoveries. It requires *Herculean* spirit to cleanse the *Augæan* stable of the accumulation of ages; *sed nil desperandum*: led by sacred truth, error and fallacy must vanish.

The introduction of an immense number of volumes is frequently supposed an indubitable specimen of profound learning, and juvenile vanity is pleasingly gratified by a free access to large libraries; but extensive libraries are, to many, great evils: for they oftener confound than instruct students, by overwhelming the memory, without informing and elevating the judgment.

The incessantly poring over books, collecting ancient and modern opinions from medical authors, and an alacrity in assenting to plausible doctrines, have been considered as studying medicine, and sufficient to entitle the scholar, with very little practical experience, to the confidence of the sick, as a regularly educated medical practitioner. The degrees of Bachelor and Doctor of Physic are frequently obtained on so superficial a foundation, as common experience, and the statutes of some universities constantly exemplify, to the disgrace of modern science and literature.

A diligent student, however, who daily observes, and writes down the symptoms of diseases, as they occur at the *bedside* of the sick, their modern and most judicious treatment in an hospital of full practice, if he hath obtained anatomical knowledge by actual dissections, will comprehend more of the medical art in three years, than the most industrious university scholar, under the influence of the former mode, can ever acquire. This I assert from above forty years observation and experience, not as a matter of opinion, but as an indubitable fact, repeatedly proved at the St. Mary-le-bone Infirmary, where I have the honour of being physician,* and at other hospitals.

The hospital student dedicating his time to the different branches of the art, not in casual reading, but in the actual practice of pharmacy, medical chemistry, surgery, and the medical treatment of diseases, under the inspection of an able, honest, and experienced preceptor, who liberally communicates the faithful result of long, judicious observation, and who guards the juvenile mind against those flights of fancy and numerous prejudices which are daily annoying the profession, will soon obtain a practical knowledge of the extent and power of the healing art, determined by repeated and real facts, ready to be applied on all subsequent occasions. The wader through stupendous volumes of endless repetitions and contradictions, supposing him sufficiently industrious for the purpose, if any excellence should occur, unless he unite practical remarks on numerous diseases by ocular demonstration in an hospital, and be possessed of a mental penetrating acumen void of all prepossession, pride, or prejudice, he is incapable of selecting the pure metal from the *scoria* with which it is obscured, or often surrounded; for he will often receive plausibilities as though they were sacred truths, and try inefficacious medicines, at the expence of the patient's life, or health, in important diseases.*

These considerations induced the author, early in life, to attempt the concentration of the most useful knowledge of ancients and moderns in *Historia* and *Schola Medicinæ*; that medical preceptors, if disposed, might convey science with less circumlocution and seducing speculation, and that

* In the medical department there, the field for observation and practice is immense, my prescriptions taken collectively amount to above 20,000 annually, which has been proved by an estimate made by Dr. Hooper, of the said Infirmary.

† If the student were to wade through the stupendous volumes of the great *Hoffman*, or the Commentaries of *Van Swieten*, for instance, would he discover the direct road for applying remedies to individual disease? No! he may acquire a wavering inconsistent practice, which an experienced *practical pupil* would be able to point out and correct. It is *practice* makes perfection in any practical art, not reading and contemplation: one excellent cure in a difficult disorder is worth a thousand of the most acute hypothetical reasonings, or speculations.

Students inclined to be satisfied with truth, separated from all fleeting and idle hypothesis, by being early and promptly initiated into the past and present states of medicine, they might be enabled to industriously commence improvements, wherever defects were discoverable; and thus give a degree of perfection and stability to the healing art, unknown to our predecessors; which every humane practitioner must ardently wish.* These attempts to improve the modes of instruction, humanity and the art demanded, as some small return for the confidence the author hath enjoyed so many years as a medical practitioner in this great metropolis; for if his practice and experience had not been so very extensive, he could not have been able to make these and other numerous observations to be found in the Rational Practice of Physic, &c. The first road to amendment is to discover defects; the second to eradicate, if possible, error; the third to avoid future prejudices by the exclusion of opinions however plausible; and fourthly, to be determined to generously embrace the truth; however it may remind us of past ill-formed conceits, from whatever quarter it may originate. By these liberal means hypothesis and falshood will be banished from the healing art, and it will speak a new language, the language of truth, to the confusion of all those, who, for temporary advantages, or vanity, lead juvenile students into vain, useless speculations, instead of impressing on their young minds the necessity of admitting no proposition that is not fully proved. The vain attempt to account for every phenomenon in nature, however incomprehensible, has led philosophers and physicians into continual error: they often confound the inquiry, which may be laudable, for the attainment. If men would first study the extent of human understanding, and what things the utmost industry may accomplish, they would not rush into the vice of supposing every thing obtainable that is sought; but they would rather modestly rest satisfied with being ignorant, and acknowledge their incapacity in every inquiry that exceeds the limits of human comprehension. The lesson of the great philosopher cannot be too frequently inculcated to all human beings, *know thyself*. This study might exclude pride, arrogance, and self-conceited importance, from the medical art; for medicine should be the science of *humanity* and *humility*. If universal self-knowledge were more the object of man's consideration, all reports and assertions would be well considered and analysed before they received assent. Credulity is the vice of the ignorant through simplicity, and of the well-informed through inattention: but whatever may be its excellence in spiritual matters, it is highly reprehensible in philosophy. If any thing marks the difference between strong and weak intellects, it is cool caution, or vicious credulity; and it may be affirmed, without hesitation, that in proportion as any man is credulous in what cannot be comprehended, he is superficial, mad, or foolish. This doctrine,

* Many writers reason well and practise ill, and in dangerous cases they often depend on ineffacious medicines. No inconsiderable part of the present work was arranged and written whilst the author was attending his *terms* at the *University of Oxford*, but various observations have arisen from the author's travels into *hot climates*, when in his Majesty's service, from 1760 to 1765, and through most parts of *Europe*; afterward, to inspect the excellence or defects of medical education and practice in the principal *universities* and *hospitals*: and he is convinced, from forty years study, experience, and reflection, that *theory* without a rich treasury of *practice*, is like a *body* without soul or animation.

applied to medicine, attacks, in some instances, most of the writers and philosophers from *Hippocrates* to the present day ; but reserving to some future opportunity more on these subjects, it is time to give an account of the *Schola Medicinæ*, or School of Medicine, and to exhibit its arrangement, intentions, and utility, and in what it differs from all other medical writings hitherto published.

PREFACE IN LATIN

IS short, intimating that the *Schola Medicinæ* comprehends what is useful from the earliest ages to the present period, extracted from all authors, ancient and modern ; yet so concise, as not to bewilder the student's mind in useless inquiries. What the author hath observed in his long study, practice, and reflection, is candidly, and without any reserve, introduced. The third volume, written in Latin, and ready for the press, containing, in a new and brief manner, the whole practice of all the branches of medicine, the utmost extent and power of the medical art in curing diseases, with every modern discovery that has been determined useful by facts, separated from those huge masses of speculation, opinions, and absurdity, which have constantly been forced into this practical art, will be hereafter published, if the present volumes be approved, and the author's life be spared to accomplish these intentions.

THE HISTORY OF MEDICINE

COMPREHENDS, in an abridged view, all the writers of consequence from the earliest ages to the present time ; their opinions, and the progress which physic has made, in so many ages, towards the degree of perfection, that distinguishes the most refined modern medicine from all preceding times.

At the end of the History is a Chronological Table from the beginning of the world, as generally received, to the present æra. This Table is divided into columns, shewing the times when the principal inventors and improvers of medicine lived ; namely, from the creation of the world ; before Jesus Christ, in what Olympiad of the Greeks, and how many years from the building of Rome. By this Table may be discovered, when, and under what reign or government, the most eminent contributors to the art of medicine flourished ; as likewise philosophers, princes, emperors, &c.

THE CONSPECTUS.

THEN follows a *Conspectus* of the whole work, shewing the methodical arrangement of the *Schola Medicinæ*, and a brief intimation of whatever the work contains.

PLATES IN THE HISTORY OF PHYSIC.

THERE are six plates in the History of Physic, which, as they are more curious than useful, shall be concisely explained, not, in all instances, exactly corresponding with the Latin. There have been many medals and coins struck in honour of medical deities : the inscriptions still extant are almost innumerable, cut in stone, and still preserved among the curiosities in Italy, a large collection of which I made in my travels.

P L A T E I.

IS a representation of the most ancient and curious piece of Ægyptian sculpture now remaining; known by the name of the *Tabula Bembina*, or *Isiaca*; perhaps soon to be removed (amongst other excellent antiques and works of art) from Italy to the famous Paris gallery, now erecting for the spoils of the present unparalleled and destructive war. The grand gallery extends, it is reported, from the garden of the *Thuileries* to the *Place de Louis Quinze*. The figures on the left and upper side consist of *Isis* on her throne in the middle; the two figures on each side with swelling breasts are supposed tutelary deities, &c. The letters of reference to the plate have been omitted, but the following description, chiefly from *Kircher*, will be a sufficient explanation.

Explanation of the first Plate of the History of Medicine.

THAT the reader may have a clearer view of the whole, I will give a plan, or scheme, taken from the *Menfa Isiaca*, called the *Tabula Bembina*; because the most eminent Cardinal Bembus first obtained it, an inestimable monument of Egyptian antiquity; which then, by the help of *Æneas Vicus*, of Parma, came into the possession of the Duke of Mantua, and was placed in his *Gazo Phylacium*, or cabinet of curiosities: afterwards, it was carried away at the siege of the city: lastly, I know not by what good fortune it was brought to the Duke of Savoy, and I hear, it is preserved among his rarest cimelia, or precious gems. From the the *schematisma*, or plan, of this plate, it seemed best to select the medium to prove the truth of what is here mentioned; from which will clearly appear the manner and way of representing the supreme deities of the Egyptians, which is as follows:

Here may be seen the throne, A. B. C. D. L. M. which the Hieromystæ, or sacred interpreters of religious mysteries, call the great gate of the Gods, constructed with all the symbolic architecture; whose coronis, or highest ornament, or frons A. B. represents flames rising in the form of serpents. The second coronis C. D. with a winged globe, the third E. F. and basis L. M. of the throne, are marked in the same manner. The whole coronis, with two columns E. L. and F. M. is marked with white and black steps, of which E. L. sustain the small head of *Isis* put on it. To this throne is inserted a figure S. in a female dress, from the middle to the feet in the form of feathered drawers, from the middle rising towards the chest a swelling breast. Her head is covered by a sacred *vitta Ægyptiaca*, Meleager, or Ægyptian head dress, a turkey hen is expanded over head, which endeavours to fly,

on its back is a *calathus*, or sacred cup, from which the leaves of two *persea* spring, and two *cornua*, which include the circle marked with the figure of a scarabeus, or beetle; in one hand she holds a sceptre with the flower of the *lotus*, or herb, the seed of which the Egyptians made bread; with the other she expresses that gesture, in which any thing is commanded to be done in an imperious manner. She sits on a polished seat, on which is delineated the figure of a dog in a sitting posture. Under the throne is seen an abacus, the limbus, or border, of which, as well as all the circle of the throne, is decorated with stars. Within the abacus is placed a figure laying down, composed of a lion and hawk, *ισραχο-λεονωμορφος*, which is ornamented on the head with the phasis of the August, or sextile moon, with a star; containing by its anterior feet a canopus, but on its back vero globu alatus serpenter is seen with a scepter.

The supreme corona A. B. of the throne, or gate, spread out like flames *εφιομορφων*, indicates the Supreme Intelligence filled with light and life, eternal, incorruptible, free from all contagion of matter; *Ημεν μεν βλεψης μορφης αλερ ε ιεροσ τυρ λαμπομπερον σκηνηδον ον ολον καλεσ βυθια κοσμος, κλυθε τυρος την Φωην*.—When you see the sacred fire glittering without any form of the whole world, then you advert to the word of fire.—*Zoroaster in oraculis*.

— Besides, all the images on obelisks are nothing else than amulets, seu prophylactica, or spells, or charms, which by the mentioned analogical apparatus of things, as soon as they were consecrated, they believed that by the superior powers they derived virtue through a certain inevitable necessity, and that all the train of evils were averted.

averted by the assistance of the genii who presided over them; concerning which there are many very curious circumstances in the *Magia et Theologia Hieroglyphica*, to which we refer the reader. They held magic schemata of this kind of great efficacy and virtue in the cure of occult diseases; for the genii, to whom the rites and ceremonies were offered, were supposed to appear during sleep to those who were expiated by a previous faith, or disposition, and teach them the cure of diseases, as the scribe Astrampsychus relates concerning the epic. He consulting Isis concerning an incurable disease in the night time, saw the same standing with ox's horns a flowery tutulus, a variegated garment, in the same manner as they represent her hieroglyphically adorned in adytis, or altars; she offered to him with her hands the herb *mstrumtin*, the only medicine for the disease with which he suffered, which herb, when after sleep he had carefully obtained, he cured himself, and as many as were troubled with this disease, by its application, from the fear of death. See many circumstances concerning these things in hieroglyphic medicine, and magic.

— Two figures are placed near it, the one R. with a male, the other X. with a female habit, *tutuli*, or tutelary deities, with flowery sceptres and swelling breasts, who seem by their looks towards Jynges, the first mind, to attend his commands; the leaders or guardians of the sensible world, according to Psellus et Jyngis, the administrator of these, and they indicate the active and passive principle of things; by the virile and female habit with the swelling breasts, they pourtray fecundity; by their contracted hands they shew efficacy in acting; by their tutuli and sceptres, they exhibit a power given to them in all things from the lyux; in the tutulus trigonus, affixed to the globe, they shew that all things flow from an archetypus trigonus, or archetype triangle; * by the serpents contorting themselves in the tutelary figure X, the vital motion is observed in all things; by the word *tutuli*, they demonstrate, according to the ideas conceived in the Supreme Mind, they shew that He administers the orders of things; all which are confuted by so many and so great mysteries, that, I will not say one page, nor one whole book, can properly explain

them; wherefore it is sufficient to give a specimen of the mystic solertia, or comforts, with which the wise ancients adorned their sepulchres: he who is desirous of attaining farther information may consult the hieroglyphic works, where he will find all fully described, and differently proved, in the *Theologia Ægyptiaca*, and in the Exposition of the *Tabula Bemina* by Kircher, in the works of Jablonski, &c.

Second figure—*Osiris*.

Third figure—*Horus*.

IV. You observe in the Ophis stone three sparrows cut out, then three circles, and afterwards three sphynxes like lionesses; after that the Conjuratio Numinum, or conjuration of the deities, in few words in the Egyptian language. To understand this, I will explain it with equal brevity. By the three sparrows the threefold intelligible world, or archetype of the stars, Osiris; by the three circles, an evident mark of divinity; by the three sphinxes signifies three times three of the world; and as Osiris ancipitrus, or Osiris with a hawk's head, is the author of heat; so is Momphta of moisture; from their just attemperation, all things originate, which are perceived in a threefold degree of nature; so also from their discrasia, or intemperies, it is necessary that sterility is produced, to avert which they placed a patella of this kind as an *amuletum*, or amulet, on the head of the statue of Momphta, in addition to that which they pretended to obtain by magic murmur, or adjuration. The words in the Ægyptian or Coptic Language are in Latin, O three times powerful divine Osiris, Mophta, Mophta, Mophta. I beseech you three times by this sign, Thoth, Thoth, Thoth; i. e. Mercurius, who, as the keeper of the three sacred fountains, or cisterns, the keeper, the keeper, powerful with the threefold sceptre of thy dominion, &c.

V. Onuphus, a sacred bull:—for Nuphi, or enuphi, or even anuphi, signifies good But the, or ahe, signifies a bull, Onuphim; onuphim, may very conveniently be interpreted a good ox, because it portended good to Egypt, also Henuphi signifies abundance. in the Coptic Language, it expresses copia, uberitas, abundantia, plenty.

* This favours something of the Trinity, and similar vestiges remain among the Asiatics, &c.

The other five plates are representations of rings, medallions, &c. from real antiques, in fine preservation. They were engraved, or struck on various occasions; on one side of most is the head of some emperor, &c. on the other side is the representation of the deities, who, it was supposed, in those ages, presided over medicine. Among these are discovered *Isis*, *Osiris*, &c. of the Egyptians; *Apollo*, *Æsculapius*, *Hygeia*, &c. &c. of the Greeks and Romans. Many of the inscriptions are in Greek, and some few in Latin. I could here expatiate much on these subjects, having, at a former time of life, studied the *Coptic language*, assisted by the excellent grammar of that worthy man, now no more! Mr. Woide, of the Museum. These researches proved, that the deities of the Egyptians were the identical gods the Greeks and the Romans afterwards adored. The names, indeed, were different, but, in general, the meaning of the names corresponded in the *Coptic*, the Greek, and Roman. The same attributes, and, in some respects, similar modes of worship were adopted by Egyptians, Greeks, and Romans. I think, I have proved, by these investigations, that many of the Greek deities, which that extraordinary people boasted to be of Greek origin, were not so, but borrowed from the Egyptians, and, in some instances, from the Persians. These subjects, which are not much to the present purpose, and only agreeable to the antiquarian, I shall desist from speaking more on, for the present; but at some future period these investigations may be resumed, and some lights thrown on those curious opinions of the ancients concerning their deities, which the blind zeal for different religions and sectaries hath almost totally obscured. The Romans admitted the worship of whatever gods the people chose to adore, or according to the country they emigrated from: whether this hath been political, it is not easy to determine.*

Plate

* In my travels I remember, on going to view the ruins of *Herculaneum* and *Pompeii*, near *Naples* and *Mount Vesuvius*, I observed, that in *Pompeii*, the old lava and rubbish arising from the famous eruption in the time of *Pliny* had been cleared away, so as to enable the curious traveller to walk in the streets, enter and examine the houses in all their various parts; on the stucco walls are many elegant paintings, as fresh as though they were painted but a few days ago. In one street is an entire chapel, which was dedicated to *Isis* and *Bacchus*; the one an *Egyptian*, the other a *Greek*; and, nearly opposite, is the house of a Roman surgeon, where all the instruments mentioned by *Celsus* were found, and which are now deposited in the palace of *Portici*, belonging to the King of *Naples*. In this palace are eleven or twelve rooms full of the antiquities of the cities of *Herculaneum* and *Pompeii*; a catalogue of which I took, and have in my possession. What is remarkable, among other things, is an inscription on the floor, or rather Mosaic or tessellated pavement in the refectory of the above-mentioned chapel—*CORNELIA CELSA*—The famous *Cornelius Celsus*, whose work is the most sensible, perhaps, of any of the ancients, as well as the most elegant classic Latin extant, lived near the period of this eruption of *Mount Vesuvius*, which destroyed those cities, as likewise *Apuleius Celsus* lived nearer, or at the same time. It does not appear very improbable that this *Cornelia Celsa* was some relation of *Celsus*, and that one or the other lived in that very house, where complete sets of surgeons instruments were found, as likewise places formed for anatomical purposes under some of the apartments. In my small collection of bronzes may be perceived the progress of the art of sculpture from the rude Egyptian figure to the highest perfection among the Greeks and Romans. The antique bust of *Cicero*, in my possession, is a *chef d'œuvre* of art, as to anatomical accuracy. What is remarkable, that on the side of the cheek in the antique *Cicero* at *Oxford*, the wart is on the right cheek, just on the inferior margin of the *os male*, or cheek bone; that sculpture shews the great orator younger than mine. In the face of my antique, just in the same spot, wherein the *Cicero*, or rather excrescence, appears prominent in the *Oxford statue*, is a circular indentation in mine, as though the excrescence had been extirpated, and the part after the removal had formed an

Plate the Second of the History of Medicine.

I. Salus, the image of health, is not rare in coins.—The veneration of health, or salus, was very great among the *Greeks*, as well as the *Romans*: from hence these frequent inscriptions—to perpetual health—to public health—to sacred or holy health—to *Æsculapius* and health, &c. in *Gruter* and *Reynsius*, &c.

II. A sacrifice to health.

III. *Æsculapius* sacrificing to the sun and moon.

IV. *Iſis* with *Mercury's* golden wand, or rod.*

V. A Pantheon head, not female but male, with the horn of the *Arietine* *Jupiter Ammon*; the calathus, or sacred cup, intimates *Serapis*, the trident *Neptune*, the serpent *Æsculapius*, &c.

VI. *Iſis* joined to *Serapis* and *Osiris*.

VII. A golden ring with *Serapis*.

VIII. A ring with the healthful goddess.

IX. A sacrifice to the god of physic by the *Pergamenians*.

X. *Serapis* worshipped by the *Rhodiens*.

XI. *Serapis* adored at *Rhodes*.

XII. The people at *Cos* (where *Hippocrates* flourished) adoring *Æsculapius*, *Diana*, &c.

XIII. *Minerva* and *Æsculapius*. The *Pergamenians* coming from *Arcadia* worshipped *Æsculapius* and *Minerva*. *Lucian*, in his witty manner, says, that *Æsculapius* exercised the art of medicine in this city (at *Pergamus*) and had opened a shop, meaning the temple, where credulity and superstition led the faithful, as

hollow. They both correspond as to the situation of the wart, only that in the *Oxford* it remains protuberating beyond the skin; in my bust of *Cicero* it seems to have been removed. The bust, I have, could not have been finished long before the great orator's cruel death; the expression in the face is striking, and corresponds with some antique seals of which I had impressions. The face, the *pomum Adami*, the muscles of the neck, the clavicles, superior parts of the breasts, &c. are all exquisitely delineated and finished with the most expressive strokes of art. There are but three antique busts of *Cicero* extant in Europe except that which I possess, which I procured in an extraordinary manner. This may appear a digression, but as I have hinted in my book on the Necessity of encouraging Anatomy, that the defects in modern sculpture are owing to want of exquisite anatomical knowledge, some liberal and generous prince, protector of the arts, may arise hereafter, who would not suffer the students and artists to copy from Greek or Roman originals, when, if more judicious modes of studying geometry, mathematics, optics, and catoptrics, were adopted, and proper encouragement given in the Royal Academy to persons of real merit and abilities, men would appear who would soon equal, if not surpass, the most cultivated ages of the *Greeks* and *Romans*. The most excellent artists would not servilely and humbly copy, but would elevate their minds, and give the grandest specimens of originality in their admirable productions. It is the interest, it is the duty of princes and nobles to encourage the arts, literature, and all men of genius; for who can display their virtues, reprehend their vices, or conceal their defects, like men of discernment and writers of abilities? When the most distinguished characters in literature and excellent morals are neglected, and suffered to pine in want, in countries abounding with opulence and every species of luxury; when truth, honour, probity, and every laudable virtue is nearly extinguished, and princes and nobles are only famous for dissipation, immorality, or frivolity, it may be depended on, that such a corrupt country is on the brink of destruction, and though mean temporary expedients may blind and oppress the people, and retard, for a time, the entire fall, yet it is inevitable. Had *Louis Sieve* been more vigilant, and had he attended more to the wise prescience of literature, than to the flattery of corrupted and corrupting sycophants, who always pursue their own interests, that worthy, well-intentioned monarch's fall and death could not have happened; nor any of the horrid cruelties that succeeded the French revolution. Learning and sagacity are mischievous weapons when provoked by contempt and want. A few thousands annually presented from the royal purse would make the weeping face of science smile, and his Majesty would be immortalised, not as the nominal, but as the real lover and protector of the fine arts. *Louis Quatorze* knew this secret, and has left institutions at *Paris*, that will ever be respected by all posterity; however civil discords may, for a time, obscure their lustre.

* It was figured by the Egyptians like two serpents knit together in the middle, which knot was called *Hercules's knot*. This wand, as also the harp, was given to him by *Apollo*, wherewith he had power to bring souls out of hell, and to cast any one into a sleep. *Vid. Serv. in Æn. viii. 138. and Pliny ix. 3.*

usual, to offer their payers, in hopes of dreaming what might prove beneficial. A juggle not unlike *modern Magnetism*.*

XIV. In coins familiar to Alcilia. The head of

health, and the image expresses sickness or ill-health, administering the serpent, the symbol of *Æsculapius*, as a remedy, with much devotion, from that beautiful figure.

Explication of Plate III. of the History of Medicine.

I. *Æsculapius* carried to Rome, and a thena, or divine rites, decreed by Cæsar. A serpent is seen placed on an altar. History teaches, that *Æsculapius* was carried in the form of a serpent from Epidaurus to Rome, &c. Before Christ 291 years, in the year of the world 3693, in the 122d Olympiad, and 463 years from the building of Rome, as may be seen in the Chronological Table in my History of Medicine in *Schola Medicinæ*, &c. This medical god was constantly implored in sickness; vota, or vows, were made and fulfilled, as may be seen from an immense number of inscriptions in my possession, taken chiefly from remains found in or near the temples of *Æsculapius*. But you see a serpent on the altar—for history teaches that *Æsculapius* carried to Epidaurus was in the form of a serpent; and it is evident that he was represented in this coin, from the last coin of the Rubrici; for in it this altar is seen with the serpent and a ship projecting from it. With respect to the thena decreed to Cæsar, is certain from *Suetonius*; what is therefore wonderful if Rubrius, being dismissed by Cæsar after Corfinium was taken, hoc monumentum ejus gratiam quæserit? Bergerus.

II. Rev. Harduin describes and illustrates this coin,

Explication of Plate IV. of the History of Medicine.

I. Commodus and *Æsculapius*. *Æsculapius*, the most noted deity of the Pergamenians, without doubt vigilated for the common welfare.

II. Health of the human mind.

III. Serapis conservator, or preserver.

IV. Serapis and Isis.

V. Julianus Serapis and Hermanubis.

and the celebrated Patinus hath asserted an opinion somewhat different; *Telephorus* is seen in it, who is also called *Evemerion*, to whom *Pausanias* relates that the Pergameni sacrifice. The celebrated Patinus observes, that the garment which covers him from the head to the foot is by Martial called *Ligonicus Bardocucullus*. *Cephalon*, the prætor, again made it, when the coin was struck.

III. In this is seen, that *Adrian* hath hoped and invoked. For it is evident, that he had such miserable health, that it repented *Adrian* of his adoption, and a premature death averted *caducum parietem*.

IV. *Apis*, found under *Adrian*.

V. VI. The Egyptians and Pergamenians with every sort of health to *Antoninus Pius*. The Egyptians, indeed *Serapis*, but the Pergamenians for health and felicity address *Æsculapius*.

VII. VIII. *Serapis*.

IX. M. *Aurelius*. This coin, signed in the tenth year, exhibits *Isis* winding in the form of a serpent. The serpent is the genius of health.

X. The Nicomedians implore health to *Marcus Aurelius*.

VI. *Severus* with a serpent—*Æsculapius* is known under *Adrianople*, (sub *Ἀδριανόπολι*.)

VII. *Albinus* and *Minerva*.

VIII. *Albinus* and *salus*, or health.

IX. *Caracalla* and *Geta* commend their health to the Pergamenian *Æsculapius*.

X. *Macrius* and *Salus*. Public vows.

Explication of Plate V. of the History of Medicine.

I. *Eliogabulus* and *Serapis*.

II. *Gordianus* and *Serapis*, &c. To the second many things are to be observed; and first, indeed, I have not read ΕΦΕΣΙΩΝ ΑΛΕΞΑΝΔΡΕΩΝ as in *Patin* and *Har-*

duinus, but with the copula ΕΦΕΣΙΩΝ ΚΑΙ ΑΛΕΞΑΝΔΡΕΩΝ; so that two cities are celebrated in this coin, without doubt—for the Egyptians openly avowed *Serapis*, as the Ephesians did *Diana*.

* This is not a translation, and in many other parts the original Latin is not closely adhered to, but in general the explanations are improved.

III. Hostilianus. Serapis in a temple.

IV. Gallus. Serapis in a temple. This money was struck by the people of Antioch, as may be seen, under the reign of Hostilianus, &c.

V. Gallus and Serapis.

VI. Gallus to the salutiferous Apollo.

Volusianus.

VII. In this coin *salus*, it expresses the pestiferous lues, or plague. How much this goddess hath been fatigued, or tired with vows. There are a thousand

ways to death. Whom the plague hath spared, &c. &c. Valerianus.

Apollo preserver.

Galienus.

IX. Isis and Nemesis. A coin struck by the people of Smyrna.

X. Galienus with Bacchus and Æsculapius, according to many opinions; but it appears to me to be Æsculapius and Hygeia.

PLATE VI.

I. Galienus with Æsculapius.

In the coin struck by the Sidetes---and what shall we say to the plague, which is related to have been so dreadful under the Emperor Galienus at Rome, or in the cities of Achaia, in one day five millions of men died of a similar disease! Æsculapius was then of the greatest assistance, and hence it is not wonderful that the Sidetes did stamp an impression of him on their coin.

II. Quietus with Apollo the conservator. As Apollo prefers a branch of laurel to the arrows or bow, it is just to suppose that this refers to medical not warlike assistance; but more on this in *Bergerus*.

III. Probus and Salus.

IV. Diocletianus with Isis.

In this place I will premise in a few words, that the Isis of the Egyptians was the same with the Ceres of the Greeks, and hence the Egyptians, in the twelfth year of the Emperor Diocletian (for that is evident from the additional numeral letters L. IB. as Achilles rebelled before the eighth year, and was overcome by Diocletian; the famine, or want, which came afterwards, this coin exhibits elegantly, &c.

V. Isis with Horus.

The Greeks, when they speak of Horus, always interpret him as Apollo. Thus Herodotus, lib. ii. c. 144. relates, Ὀρῶντος Ὀσίριος παῖδα τον Ἀπόλλωνα Ἕλληνες οἰομαζουσι. Horus, the son of Osiris, whom the Greeks call Apollo, and c. 156. Αἰγυπτίῃ δὲ Ἀπολλων μὲν Ὀρῶν. And Apollo is also, in the Egyptian, called Horus.

VI. Isis.

VII. Apis embalmed according to the manner of the Egyptians, as may be seen in many real antique mummies that have reached our time.

VIII. Osiris, or the author of health.

In *Diodorus*, lib. i. p. 11. they say that these gods (the sun and moon) govern the universe, nourishing and performing all things, at three periods of the year, in an invisible manner performing a circuit, viz. in the spring, summer, autumn. Which, although they have a very different nature, yet make the year with the best consent efficient, or with an excellent consent every thing good is produced by the changes in the year, &c.

THESE plates shew the priestcraft and credulity of the Egyptians, Greeks, and Romans, with the dignity of their medical deities, whom they revered with as much faith, fear, and hopes, as any religious fanatics since their times. Irreverence to their gods was punished with death, or universal detestation, as *Soerates* experienced, and as may be seen in the orations of *Demosthenes*, when he wished to render an enemy odious in the sight of the people, &c.

After the *History*, and a *Chronological Table*, giving, in a short view by columns, the periods when the principal philosophers, physicians, and other eminent personages, flourished; commencing from the supposed beginning of the world to the Peloponnesian war, and from that

time to Justinian, from thence to the present time. A Conspectus of the whole work appears; which is of itself a short system of anatomy and physiology.

IN THE ANATOMICAL PART.

Plate I. contains a very elegant male and female figure, drawn by Mr. Edwards, of the Royal Academy, and engraved by that excellent artist Mr. Sharp, to explain the external parts, &c.

Plate *I. Two figures with the references to the former plate opposite to the page of *Greek* description, and referring to the *Latin* description, &c.

Plate II. shews the constituent parts of the human body, with the description in *Greek* and *Latin*.

Plate III. is of the bones and their junctures, connections, &c. with *Greek* and *Latin* descriptions.

Plates IV. and V. shew the front and back view of the human skeleton, with *Greek* and *Latin* descriptions.

Plate VI. describes various bones with *Greek* and *Latin* descriptions.

Plate VII. shews a side view of the human skeleton, a foetal skeleton, with the differences between the infant and adult, and the teeth.

Plate VIII. exhibits the parts composing muscles, examined with a microscope, as an introduction to myology.

Plate IX. a front view of the muscles, the references in the opposite single page, with the *names*, *origin*, *insertion*; and *use*; in three columns distinctly exemplified, so that the student with the greatest facility, especially if he dissect with the plates before him, must obtain a perfect knowledge of all muscular motion.

Plates X. XI. XII. XIII. XIV. XV. XVI. shew the second, third, and fourth layer of muscles, in the fore and back view, with references in single pages to each plate.

Plate XVII. A view of the muscles of the whole body laterally.

Plate XVIII. shews various muscles not reducible under the former nine plates. After this the myology is completed with the manner of dissecting muscles, and the different subjects necessary to be chosen by the anatomist for preparing the bones, muscles, nerves, injections, &c. with many useful rules to be observed in anatomical studies and dissections.

Angiologia, or the knowledge of vessels, which are arteries, sanguiferous veins, and lymphatic vessels; these are all perspicuously exhibited in three columns, in a manner entirely new.

Plates XIX. XX. are front and back views of the arteries of the whole body, as they appear when injected.

Plate XXI. is a view of all the veins of the whole human body, with a reference in one page shewing the origin in extremities, their various directions and terminations, &c. in the manner the blood passes from all the veins to the *cava*, from a drawing of Mr. Paillou's.

Plate XXII. is of the lymphatic glands and lacteal vessels, by which is shewn how nutrition is performed: by lacteal absorption and passage of the chyle to the thoracic duct, subclavian vein, &c.

Plate XXIII. is a whole elegant figure drawn by Paillou, representing the lymphatic glands and the lymphatic vessels of the whole human body, explained in three columns under the heads of *name and seats of glands*—*vasa inferentia*—and *vasa efferentia*, by which a complete knowledge of the whole lymphatic system, its diseases, &c. is easily acquired.

ADENOLOGIA, or an EXPLANATION of the GLANDS,

Contains all the ancient opinions and modern discoveries of the glands of every species, their situations and uses.

A conspectus of all the glands in three columns, under the heads of name and seat, habit, function. This mode of exhibition is entirely new, and greatly abridges the science of Adenologia.

NEUROLOGIA, or DOCTRINE of the NERVES.

The ancient and modern opinions of the nerves, containing extracts in *Greek* and *Latin* from *Rufus Ephesius*, *Herophilus*, *Erasistratus*, *Galenus*, *Oribasius*, *Vesalius*, *Eustachius*, *Leeuwenhoek*, *Willis*,

Willis, *Vieussens*, Winflow, *Monro*, *sen.* Whytt, Haller, Meckel, Zinn, Moscati, Pater de la Torre, Prochaska, Alex. *Monro*. jun. Walker, and some new ideas of the present author on the nerves, &c.

Plate XXIV. is a complete section, as large as life, of the basis of the cranium, shewing the origin and direction of the nerves to the sensitive organs, &c. through the foramina from the brain.

Plate XXV. shews the basis of the brain, or cerebrum, with the vessels.

Plate XXVI. The plexus of the cerebrum, corpus callosum, corpora striata, thalami nervorum opticorum, pineal gland, &c. &c.

Plate XXVII. The arteries of the brain, &c. of the full size.

Plate XXVIII. Of the medullary spine, pineal gland, &c. a complete treatise of the brain and all its parts, with a comparative view of the weight of the brains of most animals, with the weight of their bodies, including *man*, &c. to ascertain the different quantity of brain each animal possesses compared with man; in which it is proved that the human brain is not the largest, as vulgarly received.

Of the cerebellum, medulla oblongata, spinalis, &c.

Plate XXIX. and XXX. exhibit the ganglions of nerves and funiculi.

Plate XXXI. shews the component parts of nerves magnified by a microscope in thirteen figures. This investigation exposes many erroneous doctrines of the nerves.

The vessels of the cerebrum, cerebellum, and medullary spine.

Plate XXXII. as large as life, shewing the intercostal cervical nerve, or sympatheticum magnum, ganglions, &c. proceeding to the heart, diaphragm, &c. This elaborate demonstration, in concert with others, shews evidently, how one *viscus*, or part being affected by irritation, or compression, may affect others, even remote from the seat of disease.

Plate XXXIII. A reference plate to the foregoing, as large as life.

Plate XXXIV. shews the nerves of the right side going to the heart, with two more figures of ganglions, &c. nerves, &c.

VOL. II. *NEUROLOGIA continued.*

Plate XXXV. large as life, or further explication of Plate XXXIII. &c. of arteries, veins, nerves, ganglions, muscles, &c. nervous ramifications, &c.

Plate XXXVI. A complete view of the nerves of the thorax and abdomen, &c. large.

Plate XXXVI. (2) A reference plate to the former, large as life.

Plate XXXVII. shews the celiac ganglion, mesenteric plexus, and right hypogastric nerves, with veins, arteries, vertebrae, &c.

Plate XXXVII. (2) is a reference plate to the former, full as large as the adult.

Plate XXXVIII. Nervum sympatheticum magnum and par octavum in the left side.

Plate XXXVIII. (2) The reference plate to the former, large as an adult.

Plate XXXIX. exhibits the nerves of the liver and stomach from the conflux of the right and left celiac ganglions, &c. &c. exhibiting how the stomach may affect, or be affected by diseases of other parts.

Plate XXXIX. (2) Large reference plate to the last. The mode of dissecting and preparing the nerves for anatomical demonstration fully explained. These representations of all the nervous system are most beautifully drawn and engraved, and the references in number amount to some thousands. These minute demonstrations will gratify the most inquisitive and contemplative mind by a series of real facts of the supreme government and influence of the brain and nerves, as ministers of feeling and all human sensations, sympathies, antipathies, &c. &c.

SPLANCHNOLOGIA

Treats of the integuments, viscera dedicated to forming chyle, secreting urine, semen for generation, the organs of breathing, of the circulation of the blood, and lastly, the organs of the senses.

Plate XL. shews the internal parts composing the thorax and abdomen, with references in one page arranged in three columns under the heads of name and situation—structure, connections, and uses; by which the contents of the thorax and abdomen are briefly and clearly explained, so as to leave an impression on the

mind not to be easily effaced.

Plate XLI. shews the abdomen, the intestines, &c. being removed. The liver, gall bladder, pancreas, spleen, kidneys, ureters, bladder, large vessels, &c. are represented in *situ naturali*.

Differences between the adult and the embryo.

On the EYE and DOCTRINE of VISION.

Plate XLII. shews the arteries, tunics, and humors of the eye in five figures, which prepares the mind for the skilful consideration of eye diseases.

Plate XLIII. shews the nerves of the bulb of the eye, vessels, &c. ganglion, ophthalmicum, with the ciliary nerves, &c.

Plate XLIV. exhibits the membrana corneae ciliaris, by which is joined the chryalline lens with the vitreous humor, &c. their minute arteries—Meibomius's glands, viae lachrymarum, &c. in ten figures.

Plate XLV. Origin of the tunics of the eye, reticu-

lum choroidi instratum, plicæ processus ciliarium, or plaits of the ciliary processes, annulus, or ring of the iris, &c. in six figures.

Plate XLVI. Muscles of the bulb of the eye in five figures.

Plate XLVII. The representation of the heart injected with wax in two figures, with the auricles, large vessels, &c. concerned in the circulation of the blood.

Plate XLVIII. explains the circulation of the blood, the valves of the heart, &c. as the valvulæ mitrales, tricuspidales, &c. &c.

An epitome of anatomy for the junior students, and for those intended only to practise surgery, &c. in which is abridged all that is necessary to be known for the purposes of practice, particularly for surgery, and midwifery, &c.

Hygælogy, or the doctrine of the fluids of the human body, whether secreted, or not secreted.

PHYSIOLOGIA.

The explanation of the functions and actions of all parts of the living or animated human body. Anatomy demonstrates all the parts in the dead body; physiology considers and explains the manner in which the living body performs the functions necessary for life and health, &c.

The physiology of the human body is greatly abridged, and yet is ample, as to utility. It is shewn in a new point of view in three columns, from which are excluded all idle hypotheses and vain speculations; under the heads of physiology—scholia—pathology—by which at one view are seen the doctrines of the parts and functions, the real causes of their action, as far as human understanding extends, and their appearances after death from diseases, which form the foundation of morbid causes, and rational plans of cure.

Plate XLIX. shews the pharynx and larynx, or the organs of swallowing, voice, &c. in many figures from dissections fully explained.

Plate L. Of the organ of hearing.

Plate L. (2) Reference plate to the former.

Plate LI. Of the omentum, intestines, &c. in which some errors are corrected,

Plate LII. Second plate of the same with the bile, ducts, &c. to shew the course of the bile.

Plate LIII. The genital parts of men, arranged in a concise manner.

Plate LIV. The genital parts of women, external and internal.

An epitome of physiology for junior students, containing the principal objects necessary to be remembered in the practice of physic.

The plates in the *Schola Medicinæ*, including reference plates, amount to sixty-six, elegantly engraved by capital artists, among whom will be found Sharp, Royce, Cooke, &c. The bones and muscles, arterial and venal systems, are particularly designed for surgery students, and the whole work for those who wish to become learned physicians. The various plates of the nerves, their ganglions, connexions, plexuses, &c. &c. of all the principal parts of the human body, are particularly interesting to every physician who would wish to account for the various symptoms of diseases, either directly of parts, or indirectly by sympathy. In these minute investigations many hundreds of references in the reference plates lead the studious pupil *gradatim* to a profound knowledge of the minutest causes of all different human sensations and signs of diseases, arranged and exhibited in such a manner as to leave, it is hoped, a durable impression on the mind, ready on all to be usefully applied to medical practice.

In short, the *Schola Medicinæ* is calculated to answer the most ample purposes of instruction; to render most other books unnecessary, as far as *facts* and *just reasoning* extend; and, to early fortify the juvenile mind against those frothy conjectural effusions, which too often, *pro tempore*, injure the Pæonian art. It must be submitted to the discernment of the learned and candid, to determine on its probable utility, by considering the labour of the arrangement and execution, and by comparing the practical use of the *Schola Medicinæ* with any other single production extant.

The methodising of the work, its gradual execution, the slow progress of the drawings and engravings, with which the letter-press was frequently obliged to keep pace, have consumed a period of above twenty-five years, as far as the author's other writings, and an extensive medical practice, would permit. It was written in *Latin*, that it might become more universally useful to all nations. The style, it is hoped, is conspicuous, concise, and intelligible; those who have neglected their *Latin*, may, perhaps, find this performance useful in regaining, what may, in some measure, have been lost, and the junior students, it is hoped, will be incited to pursue their studies in the learned languages, which will amply reward their labours, and give additional lustre to that profession, in which they should attempt excellence as members. It is the duty of every physician to leave the art better than he found it, by dedicating to study the idle hours consumed in amusement: for dissipation is always inimical to serious reflection.

The necessity and utility of this work, it is presumed, will be acknowledged; when it be considered, that no one book comprehending anatomical plates, with references to each in one page of letter-press, and a complete physiology and pathology exhibited at one view, by *columns* that run parallel, has ever yet been published. The labour of consulting various writings separately would require such a collection, that the expence would be enormous, and the advantages to pupils doubtful, through the great errors in their arrangement. Many writers of former works have rather wished to appear splendid than useful, and much time has been lost in endless repetitions of flying from the *copper-plate* to the *references*; from the *references* to the *copper-plate*: the tediousness of which mode of conveying instruction is often considered by students so prolix or difficult, that ignorance is preferred, frequently, to science, when obtained only by such laborious means. All these difficulties

difficulties are now obviated. In the present performance, all that is contained in each plate is compressed into *one* concise page of letter-press, opposite, by being printed in a small type, cast expressly for the purpose, and each page is divided into *columns*, in such a manner, as not only to give an exact description of the parts viewed, but likewise their connections, uses, &c. The result of the most tedious and laborious study is contained, frequently, in a short sentence, or self-evident proposition; thus is reduced, into a small compass, all that is necessary to be well known or remembered, when applied to the *medical, chirurgical, or obstetric art*. By these means hath *sixty six* pages contracted all that is necessary to be comprehended in anatomy, except, that the *nerves*, their *ganglions*, &c. have required longer descriptions. Besides this concise and useful arrangement, there is an *abridged anatomy and physiology*, containing the whole modern knowledge. To render, however, the work more important, it contains a more diffusive description, for the use of lecturers, teachers, or professors, planned and executed in such a manner, that all which is useful in the large volumes of anatomical writers, &c. will be found in this work, without that prolixity for which many authors and lecturers have been so justly censured, by all who would wish to facilitate instruction, and render the deepest erudition of the art accessible to all capacities. To all junior students it may be an introduction previous to hearing lectures, and afterward, the companion of the dissecting room; to those who have passed through their studies, it may prove a very concise and useful recapitulator, by the exhibition of those anatomical preparations and facts, from which all actual and demonstrative knowledge was acquired requisite for successful practice.

The practical Application of the Schola Medicinæ.

I. For obtaining anatomical knowledge and physiology.

On viewing the print, with or without anatomical preparations, let the engraving be examined, or compared with the *real* subject, and the written description, connection, and use of the part, be read in *Schola Medicinæ*: by this procedure, it is impossible not to easily comprehend, in a very short time, the anatomical structure, situation, and use of every part of the human body.*

II. In *physiology*, let the pupil read the description and use of any part or function in the *first column*, and the *scholia*, or reasoning, if any, in the *second column*, by which is readily acquired the *nature, action, power, and utility*, of any part, or parts, during *life*.

* Words and things are easiest taught, and best comprehended, together. The attainment of all languages, arts, and sciences, is quicker acquired by such means, than by the common slow methods of communicating knowledge, which oftener darken than enlighten. *Descriptions*, however well expressed, cannot convey clear ideas of diseases so immediately, as a *view* of the sick. At the St. Mary-le-bone Infirmary, I have *classed* disorders in a new manner, in *separate wards*, and on the *door* of each is written *male, or female, pulmonic, fever, chronic, small-pox, chirurgical, venereal, casual, childrens, convalescent, &c. &c.* The name at the *entrance* gives the *genus* of the disease, and the numerous sick, within each airy ward, give the individual varieties of *every species*. The prescriptions taken, in the medical department, amount annually to above 20,000: which extensive practice, arranged in the foregoing manner, affords pupils a rapid opportunity of comprehending the *routine* of medical practice, when united with other advantages. Mr. *White*, obligingly attending to many hints on the common defects in the structure of hospitals, delivered by me, has displayed an uncommon judgment in the plan of this humane infirmary, calculated to answer all the beneficent purposes of the noblemen and gentlemen, who are guardians of the poor of this most opulent and liberal quarter of *London*.

III. In *pathology*, the knowledge of the causes and effects of diseases will be easily ascertained by directing the eye to the *third column* of any part, where will be found the appearances, from *disections*, after death. Thus blending, in one view, the actual living functions, the reasonings resulting, and the visible defects of all the parts of the human body, *post mortem*, a complete knowledge of the *real* causes of most diseases may be acquired, without having recourse to the imaginary conceits of dubitable hypothesis.

IV. In the rational practice of physic, surgery, &c.

The previous science already described prepares the medical practitioner to reflect sensibly on the positive danger, difficulties, or probable facility in the treatment of diseases and performing operations. With this rational foresight, and a perception of the resistance to be expected in any disorder, united to the previous and present state of the patient's constitution, the indications of cure and contra-indications are discoverable, and apt remedies may be judiciously prescribed, from their known and experienced power and efficacy. To attempt healing the sick without comprehending the complicated and real causes of diseases, determined by anatomical, physiological, and pathological facts, is like attempting to sail in a ship on the ocean without ballast, rudder, or compass. It is random quackery to depend on any particular nostrum, or remedy, in the cure of different disorders; for, if it be harmless, the afflicted may be lost for want of an active remedy; if violent, it may kill by rash or injudicious application. By penetrating, however, into the origin of diseases from dissections and experience in former instances, and by having concluded from the *appearances after death* what could have produced the effects observable in life; a physician will not only be able to proceed in practice satisfactorily, but judge of past professional errors, and form an accurate and sagacious estimate of all future inquiries and improvements. Such a well-informed practitioner in medicine, actuated by logical reasoning, will cautiously examine novelties, but will be always open to conviction. The flights of fancy may amuse, but in all important concerns reason should be satisfied. The plausible deceptions which so often disgrace the medical profession, will be perceived with a glance of the eye; the mind will reflect with the rapidity of a flash of lightning on the competency or incompetency of human intellects in whatever may be the object of research. The delusions that lead the indolent or superficial, make no impression on such a character. If he be strictly an honest and discerning man, truth is embraced and merit respected wherever discoverable; professional prejudices, duplicity, and fallacy, are detected, exposed, and rejected. If such honourable members of society have enemies, they can only be the enemies of truth and integrity. It is the sincere wish and hope of the author, that every medical student will industriously study the profession, act with great probity, humanity, and honour, and seriously consider the important trust committed to his charge, after the regular studies the art requires. The preservation of health, the power often of life and death, is submitted to medical care and skill. To assume an air of wisdom and be ignorant, or incapable, is an heinous offence against Heaven and all human society; to be as skilful as the art admits, is an indispensable duty. If hospital pupils avoid trifling pursuits, and follow the methods I shall shortly recommend to obtain real knowledge, and if they keep a journal under the heads of *name, age, symptoms, disease, remedies, and observations*, divided into columns, according to the form in use at the St.

Mary-le-bone Infirmary, it is next to impossible for the studious not to well comprehend the whole *arcana* of practical medicine in the space of two or three years, from whence they may proceed to the university with credit. It should, however, be recollected, that universities are generally under the dominion of the sacred theological profession, and the discipline observed, agreeably to the statutes, is more adapted to the purposes of religious faith, or classical erudition, than medicine. Seven years are consumed in obtaining the degree of Master of Arts, in which acquisition no medical studies whatever are pursued; though every other branch of academical learning may be obtained in the highest degree of perfection. Any Master of Arts may enter on the medical line, have a Bachelor of Physic's degree in one year, and a licence *medicinam exercere per totam Angliam*. How capable any student may be to visit the sick, and prescribe remedies in all diseases, after such an education, is not difficult to determine. It is hoped, however, that a more rational mode of study will be established, and that *Schola Medicinæ* may prove useful in assisting such a noble example of necessary reformation; for which the work was principally written, in the author's apartments at St. Alban's Hall, Oxford. As a book of information on the subjects of which it treats, it may be useful to the students of law, physic, and divinity, to philosophers, and even the nobility and gentry: for every gentleman and magistrate should have some general knowledge of the human body. To professors of learned universities it solicits protection, as it is presumed it may greatly tend to abridge their labours. The mode of procedure, recommended in *Schola Medicinæ*, is directly contrary to the common university plans of medical education; for these say, *ubi philosophia desinit, ibi medicina incipit*: but it is insisted on, that students should be first instructed in anatomy, and familiarised to practice by a studious and accurate observation of the sick in all possible situations of disease. After receiving the numerous facts with diligence, that an extensive medical practice presents, the student may inquire, at leisure, into the causes and effects he hath actually observed, with all the various phenomena of nature at the university. *Aristotle* has justly asserted, *nihil est in intellectu quod non ante fuit in sensibus*. To advise or teach pupils to reason and account for what they have not seen, or to meditate on any visible subject by only written descriptions, is nearly as sagacious, as to attempt to teach a person born blind the names, tints, and different shades of colours; or those born deaf the sweet modulations and musical chords, that produce the most ravishing harmony. Who can expect that any person should be enabled to discern and comprehend the beauties, logical arrangement, and perfections of literary composition, who is ignorant of words, sentences, and grammar? The practice of anatomy, and of all the branches of medicine, is the grammar to the art of physic, and leads the mind safely to the more minute inquiries and sublimer studies. It is proceeding directly *ad rem*; whilst all other modes, more or less, are circuitous, doubtful, or fallacious, and often terminate in a vain supposition of actual knowledge where little exists. *Morbi non verbis curantur, sed remediis*; the general and particular application of which can only be obtained by deep reflection, the avoiding prejudices, and by long experience. Those who know not these advantages may affect to censure those who do; but by such censures they only proclaim their own ignorance of that art which it is their serious duty to better comprehend. All degrees of human wisdom and merit are relative. It is by comparison that the beauties and deformities of nature and art are discoverable to the discern-

discerning, experienced, and contemplative. To an ignorant person of no taste, the sculpture of the rudest block, or the vile daubing of a sign painting, is little inferior to the works of a Phidias, or an Apelles. Whoever will take the trouble to examine all other productions on anatomy, physiology, and pathology, and compare them with the present, will be convinced, that this is better adapted, as a single book, for students, than most others. It is not intended to depreciate any learned works, for there are many excellent, and it is from several that the present offering to the learned, in part, has been selected, and delivered in a form different from all that have preceded, to facilitate medical studies. A greater excitement to industry cannot be conceived, nor better expressed, than by the great *Hippocrates*, ὁ βίος βραχύς, ἡ δὲ τέχνη μακρὴ, ὁ δὲ καιρὸς ὀξύς, ἡ δὲ πειρὰ σφαλερὴ ἢ δὲ κρίσις χαλεπὴ.—“*Life is short, the art long, the occasions momentous, judgment difficult,*” &c. It will therefore be of the greatest importance to establish all useful truths as early in life as possible, and to abandon and suppress all useless inquiries as deviations from the main points to be considered in practice. The different studies recommended in *Schola Medicinæ* having been fulfilled, long *experience* afterwards forms the GREAT physician, and he will be the GREATEST, who is convinced, through life, he has SOMETHING TO LEARN.

Errata, &c. in the Latin *Schola Medicinæ*, are few, considering the nature and extent of the work, and the author's continual engagements in the practice of the medical profession. The learned reader will perceive some few typographical errors, which will be easily rectified; in the note, page xxxv, he will find *Hæc* instead of *Hæ*, &c.

Pag. Linea. Lege.

29—12—*per.*

44—53—*extrahendæ.*

Ibid. 55—*adfundatur.*

45—47—*dilatato.*

47—31—*adducunt.*

52—32—*obturatores.*

101—44—*constitit.*

In the translation.

xvi. —12.—*ready on all occasions.*

In Plate I. there are no references, because they would have destroyed the beautiful engraving of the celebrated Mr. Sharpe; but there is a *reference* plate added of the best figures extant for the external parts. If a comparison be made, it will exhibit the superiority of our plate to the other taken from *Kulmus*.

In the side view of the muscles no letters appear, but a reference plate is added to the English translation, as likewise another to the *veins*, to prevent letters being engraved on the drawing made by Mr. *Paillon*, which may likewise be compared with that taken from *Eustachius*.

P L A T E I.

On the Names of the external Parts and Divisions of the Human Body.

A.

VIII. The human body is divided into the head, trunk, and extremities.

The face and the parts covered with hair is called the head.

The parts of which are :

1. *Sinciput*, or anterior and superior part.
2. *Occiput*, or posterior part.
3. *Tempora*. The temples, or sides.
4. *Vertex*, or crown of the head.
- b The face.
5. *Frons*, or forehead, under the sinciput.
6. *Nares*, the nostrils from which mucus.
7. *Oculi*, the eyes under the eyelids.
- Palpebræ*, or the eye-lids.
- Cilia*, or eye-lashes, the outer edge of the eye-lids, on which hairs grow.
- Canthus major*, the great angle of the eye towards the nose.
- Canthus minor*, the smaller angle of the eye towards the temples.
8. *Male*, the cheeks, which when inflated are called *buccæ*.
9. *Os*, the mouth; it divides the lips, and is that empty space which extends from the lips to the fauces internally.
10. *Aures*, the ears; the lobe is the extremity.
11. *Mentum*, the chin in the middle of which the dimple.
- c *Collum*, or neck, is immediately below the head.
12. *Jugulum*, or throat, is the anterior part.
13. *Cervix*, is the posterior part.

B.

IX. *Thorax*, between the neck and abdomen; in which the heart, lungs, &c. are seated.

e *Sternum*, or pectus.

o *Mammæ*, or breasts, carneous eminences on the anterior part of the thorax.

Papilla, or nipple in the extreme part.

(*Scrobiculus cordis*.

(*Scapula*, or broad bones lying behind, called shoulder blades.

C.

X. *Abdomen*, or the inferior belly, is situated between the thorax and pubis; in it are contained the liver, spleen, stomach, intestines, pancreas, kidneys, bladder, &c.

g The space above the navel is called epigastrium.

The extremities of the short ribs are terminated by cartilages.

† *Hypochondria* are immediately under the short ribs.

h *Umbilicus*, or the navel, is the place where formerly the umbilical vessels passed to nourish the fœtus in the gravid uterus.

The middle part of the navel is called *acromphalon*, the surrounding skin *vetula*, when shrivelled, signifying old age.

i *Hypogastrum* is below the navel.

k The part lower down to the pudenda is called pubes, or ephebæon.

l The bones of the back-bone are called *vertebræ*, and the whole assemblage of them is the spine; (m) the lower part is called *lumbi*, or *loins*; (n) the last bone is the *os sacrum*, called *hyposphondelon*, which is terminated by the *coccyx*.

o On the sides and below the loins posteriorly are the nates, or posteriors.

q *Iliæ* are the cavities between the costæ, or ribs, and the femur, or thigh.

r *Inguina*, the groins, are next the upper part of the thighs.

D.

XI. The *arms*, or superior extremities, extend from the shoulders.

s *Humerus* is the uppermost part of the brachium, or arm.

t *Axilla*, or *arm-pit*, is the cavity under the articulation of the humerus.

u *Cubitus* reaches from the elbow to the wrist.

v *Gibber*, or *olecranon*, is the posterior protuberant, sharp end of the cubit, called elbow.

w *Carpus*, the *wrist*, from the lower end of the cubit to the metacarpus.

x The flat, broad part of the hand is called *palmæ* in Latin, and *metacarpium* in Greek.

† *Dorsum manus*, the back of the hand.

§ *Vola manus*, the inside or palm.

Digiti, the fingers; 1. *Pollex*, the thumb; 2. *Index*, the fore finger; 3. *Medius*, the middle finger; 4. *Annularis*, the ring finger; 5. *Little finger*.

E.

XII. *Pedes*, the *feet*, are the lower extremities.

y *Femur*, the thigh.

z *Genu*, the knee, is the connection of the thigh with the leg.

a *Poples*, the *ham*, behind and under the knee.

b *Tibia*, the shin-bone, is the anterior part of the leg.

c *Sura*, the *calf of the leg*, is the posterior fleshy part of the leg.

d *Calcæ*, the *heel*, is the posterior round part of the foot.

e. Below that is the hollow of the foot.

f Then comes *planta*, or the *sole* of the foot.

g Opposite, on the upper part, is the *tarsus*,

h *Metatarsus*.

i *Digiti*, the toes of the foot.

P L A T E II.

Of the constituent Parts of the Body.

XIII. The human body consists of *solids* and *fluids*.

The solids are:

I. A fibre is the most simple part of the body, destined for the construction of all the other parts.

Fibres are divided in *longitudinal* A, *transverse* B, *oblique* C, *orbicular* D, *arched* E, *angular* F, *spiral* G.

From many simple fibres longitudinally and closely applied to each other arises a simple *lamina*.

II. *Tela cellulosa*, or cellular texture; by the union of many simple laminæ is produced the *tela cellulosa*, which gives origin to almost all parts of the body.

a Is this texture seen by the microscope.

b The texture with large cells, to receive the adeps, or fat.

III. *Membrane*, is a white, flexible, thin, and expanded part.

a Closer cellular texture, like II. produces membrane III.

IV. *Tunica*, or *coats*, are membranes so turned and formed as to make various cavities; but more properly those that constitute tubes or vessels.

Vessels are long, conic, membranous ducts, through which the fluids of the body are conveyed, and are named as follows:

V. *Artery* } Is a conic, pulsating vessel, carrying the blood from the heart to every part of the body; is composed of five coats.

VI. *Vein* } Is a vessel without pulsation, returning the blood and other fluids from all parts of the body towards the heart.

VII. *Lymphatic Vessels* } Are small pellucid tubes provided with valves, they absorb from most parts of the body the coagulable lymph, and carry it to the thoracic duct.

VIII. *Valves* } Are small membranes in the heart and veins, and shut like flood-gates, that the blood and other fluids may not repass.

V. *Arterial tunics*, (*a*) the first and outer coat they take from the cavities.

b The second coat is next the former.

c The third is the *muscular coat*, made of spiral muscular fibres, whence the pulse originates.

d The fourth coat is made of the *cellular texture*.

e The fifth is the last and internal.

The *venal coats* VI. have the same structure, except the muscular coat.

All those tunics are nourished by small arteries, veins, and receive their sensation from nerves.

IX. The branches of *arteries* and *veins*. A the artery. B the vein. C the ligature in both to shew by the distention the course of the blood. D the vein

swelling below the ligature. E the artery detumescing, *e, e, e, e*, the connections of the small ramifications.

VII. Exhibits a *lymphatic* or conglobate gland injected with mercury.

A the lymphatic vessel. B the lymphatic gland; a heap of vessels.

X. *Nerves*, are white, hard, elastic, and very sensible parts; they originate in the brain, cerebellum, and medulla spinalis, and are dispersed over the whole body; by them motion and feeling is produced.

X. The nerve; A the outer coat. B the nervous filaments.

XI. The *muscles*, are organical parts, called flesh, and give motion to the body, they are composed of fibres, arteries, veins, and nerves, lymphatics, &c.

Tendons, are the ends of the muscles, called heads or tails; their fibres are tougher, stronger, and compacter than in the muscles, and of a white silver colour.

XI. A double muscle; A, B, C, the outer tendon divided. D, E, the interior tendon. F, G, two orders of fibres, making two bellies of the muscle.

XII. A *gland*, is a fleshy part of the body, hard, round, or oblong, covered by its proper membrane; composed of arteries, veins, and lymphatic vessels designed for the determined secretion, or mutation of some particular humors.

XII. A Gland. A. blood-vessels. B. a nerve. C. excretory duct. The rest represent the glandular body.

Ductus excretorius is a canal receiving in certain glands and viscera the secreted liquors, and conveying them off to the proper destined places.

XIII. *Ossa*, bones, are the hardest parts of the body, composed of strong *lamellæ*, of the cellular texture, blood-vessels, and nerves, and are destined to be a support to all the other parts.

XIII. *Os*, the bone. *a*, *corpus*, the body of the bone; *b*, *caput*, the head; *c*, the *apophysis*.

XIV. *Cartilages* are parts most similar to the bones, white, flexible, and smooth, generally adhering to the extremities of the bones. The anterior part of the ribs is cartilaginous, the same also is the wind-pipe.

XIV. *Ligamentum* is a membranaceous part destined to join and connect together other parts.

XIV. The *cross ligaments* in the poples or ham seen from the anterior side. (*a*) *Condylus externus femoris*. (*b*) *The internal condylus*. (*c*) *The tibia*. (*d*) *Fibula*. (*e*) *Ligamenta cruciata*. *a, b*, Smooth, white parts; the ends of the bones covered with a smooth cartilage.

Viscera, bowels, are organic parts, *v. g.* the liver, &c.

Organon, or *pars organica* is any enlivened part of the body destined for some particular use.

P L A T E III.

Of the Bones and their Connections.

That part of anatomy which treats of the bones is called **OSTEOLOGIA**. The bones are considered in the state when all the soft parts are entirely taken away; or when some of them are left upon the bones. Thus, osteology is divided into *dry, recent, or moist*.

Os, the bone, is the hardest, most compact, inflexible, and most insensible part of the body, composed of many small *lamellæ*, originating themselves from hard, rigid fibres, most closely attached and united one to the other, in their proper situation.

When the elements of the bone longitudinally and in a series meet one another, then arise the osseous *bony fibres*; when these fibres laterally join together, then are produced the *bony lamellæ*, or tables, between them is the effused and gradually coagulating *gluten* left, this is the origin of the bones. That point, where the ossification has first appeared, is called the *punctum ossificationis*. r.

1. A bone is flat, cylindrical, or irregular.

2. In substance compact, (d) spongy, cellular, reticular, from the closer adhesion or separation of the osseous fibres, or cohering particles.

3. The chemical analysis shews phlegm, salt, oil, volatile spirit, and earth.

4. The texture consists in laminated longitudinal scaly fibres, with transversal fibres which may be called *clavicular*. (d) Represents the inferior part of the thigh bone, with its lamellæ in their true situation.

The parts of the bones are :

I. *Diaphysis*. A is the body of the bone, which first grows hard, and is the foundation of the rest.

II. (a) *Apophyses, or processus*, are the various prominent warts of the diaphysis: the round apophyses are called *condyles, capita or heads*; others from their shapes are named *cervix, neck; spina, spine; mucro, corona, stylus, &c.* and they cannot be separated by boiling.

(b) *Epiphyses* are the osseous protuberances, which by the intervention of a cartilage adhere to the bone; and they separate from the bone by boiling, they are cartilaginous in children, harden with age, but remain always spongy.

III. *Cavities*, there are many large or small.

(c) *Foramina, or perforated holes*. The vessels and nerves pass through them.

(d) *Meatus*, are the interior cavities in which the marrow is contained.

(e) *Sinus* are the impervious cavities on the surface of the bones, and serve:

1.) To form articulations: when they are deep they are called *cotype, or acetabulum*; when shallow, *glene, sinus glenoideus*.

2.) To receive other parts, and are named *foveæ, fossæ*, as orbits of the eye; when they have a long extent they are called *sulci, furrows*.

Of the articulations of the bones.

IV. The articulations of the bones are made for the sake of motion.

The articulation with a manifest motion is threefold, and called *diarthrosis*, but is subdivided into

(f) *Enarthrosis*, or profound articulation; when a great head of a bone is received in the fovea or deep acetabulum of another bone, e. g. the head of the thigh bone in its acetabulum.

(g) *Arthrodia*, or a superficial articulation; as the os humeri is connected with the scapula, or shoulder bone, where its round head is received in the less deep fovea.

(h) *Ginglymus*, a mutual, reciprocal articulation, when a bone receives, and is received by another.

Synarthrosis, or articulation with an obscure motion: like the bones of the carpus and tarsus with the bones of the metacarpus and metatarsus.

Amphiarthrosis, or articulation with an imperceptible motion, as in the bones of the carpus and of the tarsus.

V. *Symphysis*, a concretion, when the united bones are immoveable.

The immediate are:

(i) *Raphe, or suture*, when two bones are mutually indented into one another, like the teeth of a saw.

The true sutures are: 1. the *coronal*; 2. *sagittal*; 3. *lambdoid, or ypsilonoid*: or they are *spurious*, like those on the temple bone. †

(k) *Harmonia*, when the mark of union is like a line, as in the bones of the nose.

(l) *Gomphosis*, when the bones run one into another like a nail in a wainscot, as the teeth in the maxillæ, or jaw-bones.

The mediate are, when other parts concur together: as

(m) *Synchondrosis*, when the bones are joined by cartilages, like the ribs with the sternum.

(n) *Syneurosis, or rather syndesmosis*, by means of ligaments.

(o) *Syntenosis*, when the bones are joined by means of tendons.

(p) *Synymenosis*, when the bones are connected by membranes.

(q) *Syssarcosis*, when they are connected together by muscles.

(r) Shews the radiating fibres of a bone. A is the central part of the os frontis, more perfect than the others, and where ossification first commences.

P L A T E IV.

When all the bones of the human body are joined together it is called a *Skeleton*.* The *Skeleton* is called *artificial*, when the bones are connected by brass wires; or it is *natural*, when the bones are prepared and united together by their natural ligaments.

The bones of the body are divided into bones of the *head*, *trunk*, and *extremities*.

The bones of the head and neck.

The bones of the head are the skull (*cranium*) and jaw-bones (*maxillæ*).

The *cranium*, or *calvaria*, is made of two tables, or lamellæ, between which is the *diploë*.

a. *Os frontis, frontale*, is on the fore part, called forehead.

The *os frontis* and all the other bones of the *cranium* consist of two tables, and contain a spongy substance between. Surgeons, in the operation of the trepan, should well attend to the structure of those bones.

b. *Ossa sincipitis, or verticis, the bregma*. Between a and b is a part of the coronal suture, the *ossa bregmatis*, or *parietal* bones, form or constitute the uppermost and lateral parts of the *cranium*.

c. Part of the *os squamosum*, or squamous part of the temporal bone.

2. The mamillary process.

d. *Os jugale, or male, zygoma, or cheek-bone*.

e. A part of the superior maxillary bone with eight teeth. The superior maxilla has thirteen bones and sixteen teeth.

f. *Maxilla inferior, or the lower jaw-bone*.

g. Seven vertebrae of the neck with the cartilages.

3. The transverse processes.

Of the trunk.

The *trunk* consists of the dorsal spine, bones of the breast, and the *ossa innominata*.

b. *Sternum, or breast-bone*, has, in adults, one, two, or three parts; on the upper part it has a sinus, or furrow, for the wind-pipe; and on the sides i. The heads of the *claviculæ* are articulated. On both sides are the superior seven ribs: the *sternum* has the shape of a dagger, on its point is the *cartilago xiphoides, ensiformis*. k.

l. *Costæ, the ribs*, are twenty-four in number, twelve on each side.

m. Five vertebrae of the loins with the cartilages between.

4. Processus transverseles.

n. *Os sacrum*, is composed of five vertebrae.

o. *Ossa innominata*, called by Galen *ἰσώνυμζ*, are divided into ilia, *ossa ischia*, and *pubis*. The first, 5. *Os ilium*, is called by some *λαγώνιον*, ἡ κενίωνων: the second, 6. the anterior, *pubis*, της ἡσθης ἑστῆν. The third, 7. *os coccygis*; ἡ ἰσχίον and *ἰσώνυμον*. 8. *Os ischium*,† the circular appendix on the superior part is by some called *spina ilii*, or spine of the ileum.

9. The inner cavity of the *os innominatum* and the *os sacrum* is called *pelvis*.

Superior extremities.

The superior extremities are divided, I. in the *humerus*, or shoulder-bone, composed of the shoulder and clavicle: II. the *cubitus*, the fore-arm, and is composed of the *ulna* and *radius*: III. the *manus*, hand; which is again divided into the *carpus*, *metacarpus*, and the five fingers, *digiti*.

i. The *claviculæ* are crooked like an Italian s. the round end articulates with the sternum, and the flat with the acromion of the scapula.

10. *Scapulæ*, the shoulder-blades.

11. *Cervix scapulæ*, or the neck of the shoulder-blade.

q. *Os humeri*, the shoulder-bone, or upper bone of the arm.

11. *Condylus internus*. 12. *Condylus externus*.

r. *Radius* lies by the side of the *ulna*, but is a little shorter.

s. *Ulna*, is also called *cubitus*. The *cubitus* is directed to the little finger; the *radius* to the thumb.

t. *Carpus*, the wrist, consists of eight different shaped little bones.

u. *Metacarpus*, four bones belong to it. The bones between the fingers and the *carpus*, or wrist, are named *metacarpus*.

15. Is the metacarpal bone of the thumb.

av. The bones of the five fingers. The five fingers have three phalanges, or thirteen bones, besides the sesamoid little bones, under the articulations, or joints.

The inferior extremities.

The inferior extremities consist: I. Of the *ossa femoris*, thigh-bone: II. *cruva*, the legs, divided into *tibia*, the large or shin-bone, *fibula*, the less bone, and *patella*, kneecap: III. the foot, is divided into *tarsum*, *metatarsum*, and five toes.

x. The *femur*, the parts of which are:

14. *Caput*, or the superior head, is uppermost in the furrow of which is the round ligament inserted.

15. *Collum*, or *cervix*, the neck is under the head.

16. *Trochanter major*, } are below the collum, or

17. *Trochanter minor*, } neck.

18. *Condylus internus*. 19. *Condylus externus*.

20. *Patella*, mola, lays on the *femur* and *tibia*. y.

21. *Fibula*, in Greek *πτερόν*.

21. *Malleolus internus*. 22. *Malleolus externus*.

23. *Os calcis*, calx, the bone of the heel. Between 23 and 24 are six other bones of the tarsus.

25. *Metatarsus*, has five bones.

26. The bones of the toes or the *phalanges*.

* The ancients have very well known the bones of the human body, their figures and connections, as may be seen by the Greek descriptions in the *Scholi Medicinæ*, extracted from *Hippocrates*, *Rufus Ephesus*, *Galenus*, and *Oribasius*, &c.

P L A T E V.

*The back view of the skeleton**Of the head and neck.*

- a. *Ossa parietalia*, or parietal bones, are on the sides.
- b. *Os occipitis* is posterior.
- 1. The *sagittal* future divides the upper part of the cranium into two equal parts.
- 2. The *lambdoidal* future joins the *os occipitis* with the bones of the *synciput*.
- c. *Os maxillæ*, or cheek-bone.
- d. The lower maxillary bone.
- e. The seven *vertebræ* of the neck.

Of the bones in the trunk.

The bones of the whole trunk are divided into the spine, thorax, and pelvis.

The *dorsal* spine is that column of bones reaching from the condyle of the occipital bone to the *os sacrum*, containing the spinal marrow. The whole spine consists of twenty-four *vertebræ*, which are divided into three parts; *e.* the seven uppermost are the *vertebræ* of the neck; *3.* the twelve in the middle are *dorsal* *vertebræ*; *4.* the five inferior are the *vertebræ* of the loins. Every one has a body, two epiphysees and seven processes. *5.* *Os sacrum*. *6.* *Os coccygis*.

A. The first *vertebra* of the neck is nominated *atlas*, the *atlas* has no body nor spine.

B. The second *vertebra*, *epistropheus*, besides the processes it has a dental process, like a tooth.

The *use* of the spine is to keep the body erect, to leave more room for motion, to sustain the head over the trunk, to receive and preserve the spinal marrow, and to admit the nerves to pass through the lateral openings.

f. The *clavicle*, it is the first bone formed in the fœtus, and is of a spongy fragile substance.

Its *use* is, *I.* to strengthen the superior extremities, and to hinder the falling too much forward on the breast: *II.* to give an origin to several muscles: *III.* to preserve and defend from injury the great subclavian vessels, which lay underneath.

g. *Scapula*, *homoplatea*; the shoulder blade-bones.

7. *Acromion*. The clavicles are fixed to it.

8. *Processus coracoideus*, or coracoid process.

9. The short process, or *cervix*, where a sinus is formed for the *os humeri*.

10. The *spine* of the scapula, dividing the posterior part into two.

The *use* of the scapula. *1.* To sustain and connect the arm with the trunk. *11.* To give rise or insertion to many muscles. *111.* To defend the contents of the thorax.

The ribs or costæ.

b. The ribs form the lateral parts of the thorax. Commonly there are twenty-four, twelve on each side. The true ribs, or *costæ veræ*, are the seven uppermost

ribs, connected on each side by means of their cartilages with the sternum, and with the ribs of the opposite side, make so many full circles. See also Tab. IV.

False ribs, *costæ*, or short ribs, are those which follow the former, and are five, not touching the sternum, but are connected with it by their cartilages.

The *substance* of the ribs is on the outside compact, but internally spongy.

The *use* of the ribs. They form the sides of the thorax; during respiration they increase or diminish the cavity of the thorax; they defend the lungs and the heart; many muscles adhere to them; and externally and anteriorly are placed the *mammæ*, breasts.

Pelvis.

The *pelvis* is in the inferior part of the trunk, and acquires that name from its shape.

The pelvis is composed of the following eight bones: On the posterior part of the pelvis is the *os sacrum*,

5. and *os coccygis* *6.* Laterally the ilium, *i.* with the superior margin called *crista*.

On the fore side of the pelvis the *ossa pubis*, (see Tab. IV.)

On the inferior part of the pelvis *ossa ischii*. *k.*

In women those bones are smaller and more slender than in men, particularly the *ossa pubis*; thus they make the cavity of the pelvis, and the angle between the *os pubis* and *ischii*, larger, for the better accommodation of the fœtus, and for its easier exclusion in the birth.

The connection of those bones is by means of cartilages and ligaments.

The *use* of them all is to form the pelvis and to make an acetabulum, to receive the head of the thigh-bone.

The *use* of the *pelvis* is the following: to defend part of the *intestinum ileum*, the rectum, and the urinary bladder; in men, the *vesiculae seminales*, and spermatic ducts; in women, the uterus, vagina, with the adherent parts,

The superior extremities.

- f. *Claviculæ*, g. *shoulder-blade*, *l.* *shoulder-bone*.
- 11. *External condyle*. 12. *Internal condyle*. *m.* *Radius*. *n.* *Ulna*, the superior part of which is the *olecranon*; the inferior *processus styloideus*. *o.* *Carpus*.
- p. *Metacarpus*. *q.* *Phalanges of the fingers*.

The lower extremities.

- r. *Os femoris*. 13. *Trochanter major*. 14. *Trochanter minor*. 15. *Condylus internus*. 16. *Condylus externus*. *s.* *Tibia*. *t.* *Fibula*. 17. *Malleolus externus*. 18. *Malleolus internus*. *u.* *Tarsus*. *v.* *Metatarsus*. *w.* *Phalanges*.

* Some anatomists will add the *os sacrum* and *os coccygis* under the name of *vertebræ spuriae*.

P L A T E VI.

*Of various bones.*Figure I. *Cranium, &c.*

1. Os frontis. 2. The upper foramen orbitale, where passes through the first branch of the fifth pair of nerves, with a small artery; therefore the surgeons should take care, particularly in infants, not to make incisions in those places.

3. Underneath is the frontal sinus, where the trepan cannot be performed without danger.

4. Os bregmatis, or parietal bone. 5. Os temporis, or temporal bone. 6. The squamous part. 7. The petrous part, whence. 8. The meatus auditorius. 9. The mastoid, or mammillary process. 10. The styloid process.

11. Os occipitis. 12. Os malæ. 13. Os sphenoidale, basillare, multiforme, &c.

14. Os maxillæ superioris, or superior maxillary bone; it consists of thirteen bones and sixteen teeth, if the number be complete. Of these thirteen bones, six are pairs: whereof, the lacrymal, ii. the nasal, iii. the jugal, iv. the maxillary, v. the lower spongy, vi. the palatinum, and the last odd one is called vomer.

They are joined together by a plain juncture, called harmonia.

15. Os lacrymale, or unguis; there is to be observed in it a furrow, for the conformation of the nasal duct; which is of use to consider in the surgical operation for the fistula lacrymalis.

16. The pterigoid processes.

17. The coronal future. 18. The squamous future. 19. The lambdoidal future.

The use of those futures are:

i. The better to affix the dura mater, and to sustain it firmly within the cranium. ii. That some nervous fibrillæ and vessels may pass through them. iii. To let out the vapours through the skull. iv. As some assert, and that the virtues of fomentations, poultices, and other remedies may penetrate. v. That in accidents, the fissures may not extend too far, but may stop in the futures. vi. In childbirth it is of very great advantage, that the cranium be not made of one single bone, but that there are many in the tender-boned fœtus, to slide one over the other, and bear the compression; it would otherwise cause more difficult labours.

Figure II. *The inferior maxilla.*

1. The coronal process, to which the adduct muscles are affixed.

2. The condyloid processes, by which the maxilla is articulated with the cranium, or head.

a. The Teeth. Dentes.

In both maxillæ are cavities in which thirty-two teeth are fixed.

The teeth are divided in three classes.

b. Incisores are the four anterior ones.

c. Two canini are nearly conical; the two upper canini have the name of eye-teeth.

d. The grinders, or dentes molares, they are blunt, large, and uneven.

e. Dentes sapientiæ are the hindermost, and of the same shape as the molares.

Figure III. *A longitudinal section of the cranium.*

1. The frontal bone. 2. The os bregmatis with the impressions of the vessels belonging to the dura mater. 3. The os occipitis. 4. The sella turcica, or equina, is a cavity in the sphenoid bone, and in the inside of the cranium. 5. The process of the sphenoidal bone, making a part of the septum narium. 6. The process of the ethmoidal bone. 7. The os vomer. 8. Crista galli, is a third part of the os ethmoides, very like a cockcomb. 9. The sinus of the os frontis. 10. Various openings for the nerves.

Figure IV.

The cranium with the superior maxilla laying on the vertex.

A. The os occipitis. B. The hole through which the medulla oblongata changes into the medullary spine. C. The inferior part of the os temporis. D. The os basillare. E. The os palati. F. Os jugale, *a, a.* The processes of the os occipitis which articulate with the vertebra. *b.* Sinus. *c.* The mammillary processes. *d.* The foramen for the lateral sinus of the dura mater. *e.* The beginning of the meatus auditorius. *f.* The sinus of the os temporis for the articulation of the inferior maxilla. *g.* The styloid process. *h.* Processus jugalis of the os temporum. *i.* The foramen through which the nerve of the tenth pair comes out. *k, k.* Processus aliformes of the os basillare. *l.* The vomer proceeds up to the septum narium, or the eleventh bone of the superior maxilla. *m.* A foramen for the egress of vessels. *n.* The teeth. *o.* A foramen for the passage of another branch of the fifth pair of nerves toward the inferior parts. *p.* The foramen through which the carotid artery enters the brain.

Figure V. *The bones of the carpus and metacarpus.*

The carpus consists of eight small little bones of various shapes.

a. Multangulum majus. *b.* Multangulum minus. *c.* Caputatum. Cuneiforme. *d.* Naviculare. *e.* Lunatum. *f.* Triquetrum. *g.* Subrotundum. *h.* Metacarpus. *i.* Phalanges of the fingers.

Figure VI. *The bones of the tarsus and metatarsus.*

A. The tarsus consists of seven bones. *a.* Talus, astragalus. *b.* Calx, calcaneus, into which the tendo Achillis is inserted. *c.* Os scaphoides, naviculare, cymbiforme. *d.* Os cuboides. *e.* Os cuneiforme majus. *f.* Medium. *g.* Minus. *h.* Metatarsus, *pesten*, has five bones belonging to it. *i.* The toes have fourteen bones, they have also sesamoid bones, as in the fingers.

The nails are fixed on the extremities of the fingers and toes, in which is the lunula, this is the whiter part adjoining the cutis.

PLATE VII.

*The side view of a skeleton.**The head and neck.*

Os parietale, in the superior part of the cranium.

Sutura sagittalis, joins together the parietal bones.

Sutura lambdoidalis, which connects the *os occipitis* with the parietal and temporal bones.

Os occipitis, in the posterior inferior part of the cranium.

Os temporis is in the inferior and lateral part.

Os frontis is on the anterior part.

Processus mammillaris or *mastioideus*, to which the *muculus sternomastoideus* is inserted.

Os maxillare superius, is on the anterior and middle part of the face; makes a part of the face, palate, nose, and orbit of the eyes.

Os maxillare inferius, is in the lower and anterior part of the face; is the organ for mastication.

Seven *vertebræ* of the neck.

All the *transverse apophyses* of the *vertebræ* of the neck have a peculiar foramen for the ascending vertebral arteries.

The trunk.

Scapula, the *shoulder-blade*, is on the uppermost and lateral part of the back.

The *vertebræ* of the back are twelve,

And have these particulars:

1. On their sides of their bodies is formed a fovea by the junction of two vertebral bodies, to make a head for the ribs.

2. A superficial groove on the top of the *transverse apophyses* for the less head of the ribs.

Costæ, the seven superior ribs are called *veræ*, or true.

— the five inferior ribs are named *costæ*, false ribs.

The two last, or spurious, are entirely loose.

The external superficies of the *costæ* ribs is convex, the internal is concave; here, on the inferior margin, is a furrow, which runs from the angle of each rib forward, and receives the greatest part of the blood-vessels and nerves; this is very necessary to be known in the operation of the empyema.

Vertebræ lumborum. The greatest mobility of the spine is between the last vertebra of the back, and the first of the loins.

Pelvis.

Os sacrum is in the posterior part between the last vertebra of the loins and the *os coccygis*.

The *os coccygis* has four small bones at the end of the *os sacrum*.

Their use is to form the pelvis, to sustain the intestinum rectum, and to prevent in labour pains the rupture of the perinæum.

Ossa innominata.

Os ilii forms the superior part of the pelvis.

Os ischii is inferior, *os pubis* anterior.

The *tuberosity* of the ischium is the inferior margin on which we sit.

The superior extremities.

Os humeri is between the shoulder and the fore-arm.

Cubitus is on the inside of the fore-arm, towards the little finger.

Radius is on the outside of the arm, towards the thumb.

Carpus consists of eight small bones, situated between the fore-arm and metacarpus.

Metacarpus is between the carpus and the fingers.

They constitute the middle part of the hand.

Digiti. The fingers are on the inferior extremities of the metacarpus, formed of three small bones, which are called *phalanges*.

The inferior extremities.

Femur, the thigh-bone is between the pelvis and shin-bone, or tibia.

Tibia is between the femur and tarsus, in the interior part of the leg.

Fibula is externally lying along the tibia.

Patella, knee-pan, is between the condyles of the femur and above the tibia in a sinus.

Its use is to strengthen the articulation of the knee, and to serve as a pulley to the tendon of the extensor muscles of the tibia.

Tarsus is between the leg and metatarsus.

Its use is to make the basis of the foot, and to serve towards the motion of the extreme foot.

Metatarsus is between the tarsus and the toes.

The use is to make the upper part and sole of the foot.

Digiti, the toes.

Sesamoid bones

Are small peas-like bones.

Situation in the junction under the phalanges of the thumb, in the hands and feet.

Figure II. On the skeleton of an infant.

All their bones generally are softer than in adults or grown persons, and some are yet cartilaginous.

In the bones of the *cranium* the middle part is most solid.

The *os frontis* is divided through the middle to the nose.

All the *sutures* are imperfect.

Os occipitis consists of two or four distinct bones.

Ossa temporalia are cartilaginous in their circumference.

The *meatus auditorius externus* is then wanting.

The *processus mastioideus* is not then perceptible.

Maxilla inferior, on the fore part, is divided into two parts.

Dentes, the teeth, are hid in their sockets, covered by thin membranes.

The *sternum* is cartilaginous.

Os sacrum has separate *vertebræ*.

Os coccygis is cartilaginous.

Patella, the *carpus* also and *tarsus* are cartilaginous.

All *epiphyses* in infants, in the beginning, are cartilaginous.

The *nails* in the third month already can be distinguished, in utero.

Figure III. Dentes.

a. *Dens incisivis*, or cutter. b. *Dens caninus*, or dog-teeth. c, d, e. Different *dentes molares*, or grinders, some with two, others with three roots, or phangs.

(8) P L A T E V I I I .

Figure I. Represents a piece of the *glutæus magnus* muscle, or great muscle of the posteriors, of an adult, not boiled but fresh, in which are shewn the different thickness and figure of the lacerti, muscular subdivisions, or *fasciculi*, so as they appear to the naked eye.

a. a. Is the exterior part of the muscle and the *vagina* which covers it.

b. b. b. b. Are separations caused by that vagina, and penetrate into the substance of the muscle, by which the muscle is divided into large muscular divisions, or lacerti.

c. c. c. c. Are the sections of those lacerti, appearing of different magnitude and figure.

cd. cd. cd. Shew the parallel course of those lacerti.

Figure II. Is a small piece of boiled human flesh, or muscle, taken from the *glutæus magnus* muscle, marked 1. 2. 3. 4. 5. 6. 7. 8. The boundaries and divisions which distinguish these lacerti are expressed by a single thick line.

It appears, that the greater lacerti are composed of smaller, which can be seen plainly in 1. 2. 3. 4. 5. 6. 7. And those smaller lacerti consist again of those of the smallest size; but I have delineated this only in No. 8.

Figure III. Shews a *lamella* of the *lacertus i.* in the fig. II. cut off transversely.

This lamella is delineated so, as it has appeared by a glass augmenting the objects five times in diameter.

a. a. a. a. The *vagina* surrounding the greater lacertus.

b. b. b. b. Its *processes*, going to the other lacerti, which are only in some part shewn.

c. c. c. c. Separations which are produced by the vagina of the *lacertus major*, and divide it into eight smaller.

1. 2. 3. 4. 5. 6. 7. 8. The smaller lacerti divided out of the major.

7. In this *lacertus* is particularly shewn, how each minor *lacertus* by membranous separations, is divided into smallest.

8. Here is shewn how each smallest *lacertus* is composed of muscular fibres.

Figure IV. In this figure is shewn, a small piece of boiled human muscular fibre in its length, seen by a glass, magnifying the objects four hundred times. In the boiled muscles, examined with such microscopes, the transverse white wrinkles are nothing else than superficial impressions of the vessels and cellular threads, and perhaps of small little nerves in the vagina of the fibre. When muscles are boiled they shrink the fibres in many places, and impress more or less those transverse wrinkles, called *rugæ*.

Figure V. Is another boiled fibre of human flesh, or muscle, seen through the same microscope as in the

preceding figure. But in this, partly by maceration, partly by gentle compression, the outer vagina is nearly destroyed, and therefore the *fila carnea rugosa*, which compose the muscular fibres, appear plainer.

Figure VI. Are three *fila carnea*, or fleshy threads, whose wrinkles, or greater windings *a. a. a.* are in place of those which are seen in the fig. V.

Figure VII. a single fleshy thread, or *filum carneum*, seen through the same microscope, whose serpentine windings are clearly seen.

Figure VIII. Another *filum carneum*; has transverse wrinkles, which cut the *filum* as it were into some little globules, or joints.

Figure IX. The transverse sections of three muscular fibres of the human flesh; are in their sheaths included. They are delineated by the same microscope as fig. VII. VIII.

In each of those transverse sections of the three fibres, very small and a great many *areolæ* appear.

Figure X. Is a transverse section of two muscular fibres, ex *Gado mutatio* Linnæi, whereof one is bigger, the other smaller, also seen with the glass, magnifying the diameter four hundred times, that it may be seen how the *fila carnea*, or fleshy small threads, in thickness do not differ from the human.

Figure XI. The smallest fasciculus of muscular fibres, seen through a glass, magnifying thirty times the diameter.

a. a. a. a. Muscular fibres in the smallest fasciculus.

b. b. b. b. Wrinkles and alternate windings of the fasciculus itself.

Figure XII. Besides those wrinkles, which we have seen in the preceding figure, and which compose the smaller wrinkles of the muscular fasciculus, are often smaller yet in the fibre itself, which I have found in boiled beef, smallest fasciculus of which I have delineated by the same microscope.

Figure XIII. Here is given a *lamella* of the injected *supinator longus* muscle, of a child of six months old. This lamella is drawn from a glass magnifying the diameter one hundred times.

a. Extremities torn off from the muscular fibres, which are much thinner than in an adult person.

b. b. Two principal arterial branches.

c. c. c. c. The smaller branches cut off.

d. d. d. d. The smallest branches.

Beyond those smallest vessels, the coloured injection will not penetrate; for the smaller vessels are not permeable to the matter of injection, and in particular to the cinnabar, which gives the colour to the injection; but there are minute coloured injections, which pass much farther than cinnabar, and tinge almost all the parts of muscles, so that they appear nearly vascular in every part of their substance.

P L A T E IX.

Name and origin.	Muscles of the head and neck.	Insertion.	Action.
a. <i>Occipito-frontalis</i> .	Near the lambdoid suture.		Moves the skin.
b. <i>Atollens aurem</i> , from the upper part of the pericranium.	Above the ear.		Its action is scarcely observable.
c. <i>Orbicularis palpebrarum</i> , from the orbital process of the upper maxilla.	Into the nasal process of the superior maxilla.		To shut the eye-lid.
d. <i>Depressor anguli oris</i> , from the edge of the maxilla inferior.	Into the angle of the mouth, and course of the lips.		To depress the lips.
e. <i>Orbicularis oris</i> , is formed by the muscles that move the lips.	Surrounds the mouth like a ring.		Shuts or corrugates the mouth.
f. <i>Platysma myoides</i> , from the deltoid and pectoral muscles.	Into the chin, lips, and the nose.		It depresses the chin and lips.

The muscles of the trunk.

a. <i>Pectoralis major</i> , from the clavicle, sternum, and the ribs.	Nearly in the middle of the os humeri.	Moves the arm towards the breast.
b. <i>Serratus magnus</i> , from the true and two false ribs.	On the basis of the scapula.	To move the scapula forward and downwards.
c. <i>Latissimus dorsi</i> , from the os sacrum and ilium.	In all the vertebrae of the back and loins.	To bend the back with other muscles.
d. <i>Obliquus externus descendens</i> , from the ribs near the serratus muscle.	In the linea alba and os pubis.	With other muscles it supports and compresses the abdomen.
e. <i>Linea semilunaris</i> . f. <i>Linea alba</i> , under f. <i>umbilicus</i> . g. <i>Annulus</i> , or abdominal ring.		

The upper extremity.

a. <i>Deltoides</i> , from the clavicle and scapula.	Nearly in the middle of the os humeri.	To elevate the arm.
b. <i>Biceps flexor cubiti</i> , from the scapula by two heads.	In the uppermost end of the radius.	To bend the fore arm conjointly with the brachii internus.
c. <i>Supinator radii longus</i> , from the external ridge of the os humeri.	Into the inferior condyle, or extremity of the radius.	To roll the radius outwardly with the supinator brevis.
d. <i>Pronator teres</i> , from the internal condyle of the os humeri.	Into the middle of the outward, or posterior part of the radius.	To roll the cubitus and hand inwards, with the assistance of the pronator quadratus.
e. <i>Palmaris longus</i> , from the internal condylus of the os humeri.	In the palm of the hand, near the articulations of the fingers with the metacarpus.	To contract or corrugate the palm of the hand.
f. <i>Palmaris brevis</i> , from the metacarpal bone of the little finger.	In the annular ligament of the carpus and articulation of the thumb.	To draw the thumb towards the little finger.
g. <i>Flexor carpi radialis</i> , from the internal condyle of the os humeri.	In the carpus near the thumb.	To bend the hand.
b. Part of the <i>flexor sublimis perforatus</i> . i. Insertio <i>flexoris carpi ulnaris</i> .		
k. <i>Abductor pollicis</i> , from the transverse ligament of the carpus, and from one of the carpal bones.	In the two first bones of the thumb.	To draw the thumb from the fingers.

The lower extremities.

The *fascia lata* is a strong tendinous membrane, beginning from the upper edge of the os ilium, Poupauart's ligament, and obliquus externus muscle, from the os sacrum and greater trochanter, descends down the femur, includes nearly all the muscles of the thigh and leg, at last it disappears on its extremity; the fascia keeps tight the muscles over which it is spread, and strengthens their action considerably.

b. Part of the <i>gluteus maximus</i> . c. <i>Pectinalis</i> .		
d. <i>Triceps longus</i> , from the os pubis and ilium, has three heads.	In the linea aspera of the os femoris.	To adduce the thigh-bone inwardly.
e. <i>Gracilis</i> , from the os pubis.	Into the tibia under the ham.	To bend the leg.
f. <i>Sartorius</i> , from the superior spine of the os ilium.	In the inner side of the tibia.	To bend the leg obliquely inward, to cross the leg.
g. <i>Rectus cruris</i> , from the anterior spine of the ilium.	In the upper part of the patella.	To extend the leg.
b. <i>Vastus externus</i> , from the outside of the thigh.		
i. <i>Vastus internus</i> , from the inside of the thigh.		
k. <i>Tibialis anticus</i> . l. <i>Peroneus longus</i> . m. <i>Extensor longus digitorum pedis</i> . n. <i>Gastrocnemius externus</i> .		
o <i>Soleus</i> . q. <i>Abductor pollicis</i> .		

PLATE X.

*The head and neck.**Name and origin.**Insertion.**Action.*

- a. Part of the *occipito frontalis*, with the aponeurosis; from the inferior part of the os occipitis. Under the lambdoid suture. Pulls the skin of the head backwards.
- b. *Attollens aures*; from the aponeurotic expansion of the frontal muscles. Into the upper part of the ear, on the helix by means of a tendon. To draw the ear upwards.
- c. *Anterior auris*; from the basis of the zygoma from a tendinous membrane of the temporal muscle. In the beginning of the helix, to the outer part of the concha. To make this eminence more tense.
- d. *Recrabentes auris*; arise from the aponeurotic expansion of the cervical muscles. Are affixed to the convex part of the concha. To draw the ear back.
- Trunk.*
- a. *Trapezius*, or *cucullaris*; begins from the occiput, processes of the neck, and spinous processes of the neck. In the scapula and clavicle. Moves the scapula in different directions according to the lines of its different fibres.
- b. Its tendinous junction.
- c. *Venter carnosus latissimi*. d. The tendon of this muscle, beginning with the serratus posticus inferior. e. Part of the obliquus externus abdominis.

Superior extremity.

- a. *Deltoideus*; from the clavicle and scapula. Near the middle of the os humeri. To rise the arm, with others.
- b. *Infra spinatus*; from the parts below the spine of the scapula. Lower down is the portion of the *teres minor* and *major*. In the neck of the os humeri. To draw the humerus backwards.
- c. *Triceps extensor cubiti*; from the neck of the scapula and outward part of the humerus. Is fixed to the olecranon. To extend the fore arm and to draw it a little back.
- d. *Extensor carpi radialis longior*; from the external condyle of the humerus. In the bones of the metacarpus. To extend the wrist, and bring the hand backward.
- e. *Extensor digitorum communis manus*; from the external condyle of the os humeri. On the posterior part of the four fingers. To extend the four fingers.
- f. *Extensor ossis metacarpi pollicis*; from the outside of the ulna. On the outside of the thumb. To extend the thumb.
- g. *Extensor primi internodii pollicis manus*; from the ulna and interosseus ligament. In the upper part of the first bone of the thumb. To extend the first bone of the thumb.
- h. *Extensor secundi internodii pollicis*; from the ulna and interosseus ligament. In the last bone of the thumb. To extend the last joint of the thumb.
- i. *Extensor carpi ulnaris*; from the external condyle of the os humeri. In the bones of the metacarpus, and the basis of the little finger. To extend the hand backward.
- k. Part of the *flexoris carpi ulnaris*; from the internal condyle of the os humeri. By a tendon into the os pisiforme and unciforme. To bend the hand and to contract it.

Inferior extremity.

- a. *Glutæus maximus*; from the os sacrum and ilium. Below the greater trochanter. To extend the thigh.
- b. Part of the glutæus medius. c. Part of the tensor vaginæ femoris.
- d. *Vastus externus*; from the outer side of the os femoris. On the upper part of the patella. To extend the leg assisted by others.
- e. The long head of the biceps flexoris cruris.
- f. Part of its short head.
- g. *Semitendinosus*; from the protuberance of the os ischium. } On the inner and back part of the tibia, or ham. } To assist with others in bending the leg.
- h. *Gracilis*; from the anterior part of the os pubis.
- i. *Pars vasti externi*.
- k. *Gastrocnemius externus*; from two condyles of the os femoris. } On the heel they form the tendo Achillis. } To extend the foot.
- l. *Soleus*, or *gastrocnemius internus*.
- m. *Tendo Achillis*, with the plantaris.
- n. *Peroneus longus*; from the uppermost part of the fibula. In the second phalanx. To bend with others the four small toes.
- o. *Peroneus brevis*; from the external and fore part of the fibula. In the external metatarsal bone. To bend the foot outward.
- p. *Tendines extensoris longi digitorum pedis*. q. *Abductor minimi digiti pedis*.

PLATE XI. *The second layer of the muscles on the anterior part of the body.*

Name and origin.

On the head and neck.

Insertion.

Action.

- | | | |
|---|--|---|
| a. <i>Corrugator supercilii</i> ; from the angular process of the os frontis. | Into the fleshy part of the occipito frontalis muscle. | Contracts the eye-brow. |
| b. <i>Temporalis</i> ; from the semicircular ridge of the parietal bone. | In the coronoid process of the lower jaw. | } To pull the lower jaw upwards in mastication, &c. |
| c. <i>Masseter</i> ; from the processus zygomaticus. | In the angle of the lower jaw. | |
| d. <i>Levator anguli oris</i> ; from the jugal bone, near the nose. | In the angle of the lips. | To draw the lips upwards. |
| e. <i>Buccinator</i> ; from both jaw-bones. | Into the angle of the mouth and gums. | To assist in mastication and laughing, and draw the mouth. |
| f. <i>Orbicularis oris.</i> g. <i>Depressor labii inferioris.</i> | | |
| b. <i>Sterno-cleido mastoideus</i> ; from the sternum and clavicle. | Into the mastoid process. | Bends the head forward. |
| i. <i>Sterno hyoideus</i> ; from the first rib, sternum, and clavicle. | Into the base of the os hyoides. | Pulls the os hyoides downwards. |
| k. <i>Levator scapulae</i> ; from the first four vertebrae of the neck. | Into the superior angle of the scapula. | Elevates the scapula. |
| <i>Trunk.</i> | | |
| a. <i>Subclavius</i> ; from the cartilage of the first rib. | Into the inferior part of the scapula. | To pull the clavicle forwards and downwards. |
| b. <i>Pectoralis minor</i> ; from the third, fourth, and fifth true ribs. | In the coracoid process of the scapula. | To bring the scapula forwards, or to raise the ribs. |
| c. <i>Serratus magnus</i> ; from the nine superior ribs. | Into the base of the scapula. | To move the scapula forward and downwards. |
| d. <i>Rectus abdominis</i> ; from the os pubis. | Into the sternum and the ribs. | } They cover and compress the abdomen, help to extrude the faeces, &c. and assist in respiration, &c. |
| e. <i>Pyramidalis</i> ; from the fore part of the os pubis. | Into the linea alba and lower ribs. | |
| f. <i>Obliquus ascendens internus</i> ; from the spina of the os ilium. | | |

Superior extremity.

- | | | |
|---|---|----------------------------|
| a. <i>Biceps flexor cubiti.</i> b. Its short head. c. Its long head. d. <i>Extensor carpi radialis longior.</i> | | |
| e. <i>Flexor sublimis perforatus</i> ; from the inner condyle of the os humeri. | Into the second bone of each finger. | To bend the four fingers. |
| f. The insertion of the extensor carpi ulnaris. | | |
| g. <i>Extensores pollicis</i> ; from the outer or back part of the ulna. | Into the last bone of the thumb. | To extend the thumb. |
| i. <i>Tendo flexoris longi pollicis manus.</i> | | |
| k. <i>Abductor minimi digiti manus</i> ; from the os pisiforme and annular ligament. | Into the first bone of the little finger. | Abduces the little finger. |

Inferior extremity.

- | | | |
|--|--|---|
| a. <i>Iliacus internus</i> ; from the vertebrae of the loins and the spine of the os ilium. | Into the trochanter minor. | To bend the thigh with others. |
| b. <i>Pectinealis</i> ; from the os pubis. | In the linea aspera of the os femoris. | To bring the thigh upwards, and turn it outwards. |
| c. <i>Triceps longus</i> ; from the os pubis and ilium. | In the linea aspera of the os femoris. | To bring the thigh inwards and upwards. |
| d. <i>Gracilis.</i> e. <i>Rectus cruris.</i> f. Its tendon. g. <i>Vastus internus</i> } From the trochanter major
h. <i>Vastus externus</i> } and linea aspera. | A portion of the <i>gluteus medius</i> .
In the patella above the knee. | } To extend the leg. |
| i. <i>Crureus</i> ; from the fore part of the os femoris. | | |
| l. The insertion of the biceps flexoris cruris into the fibula. | | |
| n. q. <i>Soleus</i> . | m. <i>Tendines gracilis and semitendinosi</i> in the tibia. | |
| o. <i>Peroneus longus</i> ; from the upper part of the fibula. | Into the os metatarsi and cuneiforme. | To move the foot outwards, and to extend it a little. |
| p. <i>Extensor longus digitorum</i> ; from the upper and outer part of the tibia, and from the head of the fibula. | In the four first joints of the toes. | To extend the four small toes. |
| r. <i>Flexor longus digitorum</i> ; from the back part of the tibia. | In the first phalanx of the toes. | To bend the last joint of the toes. |
| s. <i>Tendines of the tibialis postici.</i> | | |
| t. <i>Flexor brevis digitorum pedis</i> ; from the inside of the os calcis. | Into the second phalanx of the smaller toes. | To bend the second joint of the toes. |

PLATE XII. *The second layer of the muscles on the posterior part of the body.*

Name and origin.	In the head and the neck.	Inferion.	Action.
a. <i>Temporalis</i> ; b. <i>Masseter</i> . d. A Portion of the complexus. e. <i>Llevator scapulae</i> . c. <i>Splenius</i> ; from three vertebræ of the neck and five of the back.	In the mastoid process.		To bring the head backwards.
	Trunk.		
a. <i>Rhomboides major</i> ; from the four superior vertebræ of the back. b. <i>Rhomboides minor</i> ; from the three inferior vertebræ of the neck.	Into the basis of the scapula.		To draw the scapula upwards, and inwards.
c. <i>Serratus pecticus superior</i> ; from the three last vertebræ of the neck and two uppermost of the back.	Inserted into the second, third, fourth, and fifth ribs.		To elevate the ribs and dilate the thorax.
d. <i>Serratus pecticus inferior</i> ; from two ribs of the back and three of the loins.	Into the lower edges of the four inferior ribs.		To depress the ribs and contract the thorax.
e. <i>Pars spinalis dorsi</i> . f. <i>Pars longissimi dorsi</i> . g. <i>Pars sacrolumbaris</i> . h. <i>Serratus magnus</i> . i. <i>Tendo laevis</i> . k. <i>Pars obliqui interni ascendentis abdominis</i> . l. <i>Sphincter ani</i> .			
	Superior extremity.		
a. <i>Supra spinatus</i> ; from the upper part of the spine of the scapula.	Into the neck of the os humeri.		To raise the arm with others.
b. <i>Infra spinatus</i> ; from the lower part of the spina scapulae.	In the neck of the os humeri.		To draw the arm backwards.
c. <i>Teres minor</i> ; from the inferior edge of the scapula.	As above.		To bend the arm outwards, backwards, and downwards.
d. <i>Teres major</i> ; as the former.			
e. <i>Triceps extensor cubiti</i> . f. <i>Its long head</i> . g. <i>Its short head</i> . h. <i>Portio capitis tertii</i> . i. <i>Tendo tricipitis</i> . k. <i>Pars brachialis interni</i> . l. <i>Anconeus</i> . m. <i>Extensor carpi radialis longior</i> .			
n. <i>Indicator</i> ; from the middle and posterior part of the ulna.	Into the posterior part of the indicator.		To extend the indicator.
o. <i>Tres interossei manus externi</i> ; from the sides of the metacarpal bones.	In the joints of the next fingers.		To extend the fingers, &c.
p. <i>The tendo extensorum digitorum</i> .			
	Inferior extremity.		
a. <i>Gluteus medius</i> ; from the upper part of the os ilii.	Into the greater trochanter.		To bend the thigh outwards, and backwards.
b. <i>Pyriformis</i> ; from the os sacrum within the pelvis.	Into the inner side of the great trochanter.		To move the thigh upwards, backwards, and turn it outwards.
c. <i>Gemini</i> ; from the spinous process and protuberance of the ischium.	Into the inner cavity of the great trochanter.		To draw outwardly the thigh.
d. <i>Quadratus femoris</i> ; from the external protuberance of the ischium.	Between both trochanters.		To bring the thigh outwards.
e. <i>Vastus externus</i> ; from the greater trochanter and linea aspera.	Into the upper part of the patella and by an aponeurosis, to the head of the tibia.		To extend the leg.
f. <i>Pars tricipitis magni</i> . g. <i>Capus longum tricipitis flexoris cruris</i> , and below it, <i>pars capitis brevis</i> .			
h. <i>Semi-tendinosus</i> ; from the ischium.	On the inside of the tibia.		To bend the tibia.
i. <i>Gracilis</i> ; from the os pubis.	Into the tibia under the sartorius muscle.		To bend the tibia with the sartorius.
k. A small portion of the <i>vastus externus</i> .			
l. <i>Popliteus</i> ; from the external condyle of the femur.	At the internal edge of the tibia below its head.		To bring the tibia outwards with others.
m. <i>Venter carnosus plantaris</i> , and its tendon passing through the <i>soleus</i> muscle.			
n. <i>Soleus</i> . o. The tendon of the <i>gemellus</i> cut off.	p. <i>Tendo Achillis cum plantari</i> .		
q. <i>Peroneus longus</i> ; from the upper part of the fibula.	Into the bones of the metatarsus, &c.		To move the foot outwards, and extend a little.
r. <i>Tendines extensorum longorum digitorum pedis</i> ; with the <i>third peroneus</i> , and below them the <i>extensor brevis digitorum</i> .			
s. <i>Flexor brevis minimi digiti pedis</i> ; from the protuberance of the os calcis.	Into the second phalanx of the four small toes.		To bend the toes.

PLATE XIII. *The third layer of the muscles on the anterior part of the body.*

On the head and neck.

<i>Name and origin.</i>	<i>Insertion.</i>	<i>Action.</i>
a. <i>Depressor labii superioris, alaeque nasi</i> ; from the superior maxilla.	Into the upper lip and root of the ala of the nose.	To draw the upper lip down and backwards.
b. <i>Orbicularis oris</i> ; when all the other muscles are taken off.	c. <i>Buccinator.</i>	
d. <i>Levator labii inferioris</i> ; from the inferior maxilla.	Into the under-lip and skin of the chin.	To pull upwards the lips and chin.
e. <i>Sterno thyroideus</i> ; from the sternum.	Into the thyroid cartilage.	To draw the larynx downwards.
f. <i>Scalenus medius</i> ; from the transverse processes of the neck.	In the uppermost rib.	To move the neck on both sides, and to raise the ribs, &c.

The trunk.

a. <i>Intercostales externi</i> ; obliquely from every rib.	From one rib to another.	} To elevate the ribs in respiration, &c.
b. <i>Intercostales interni</i> ; from the sternum and the ribs.	Into the obtuse angle of the ribs.	
c. <i>Transversalis abdominis.</i> d. The inferior part of the tendon of the <i>transversalis</i> , passing before the rectus and the pyramidalis, here cut off. Between those portions, on both sides, is the peritonæum and ligamenta vesicæ urinariæ, which formerly were the <i>umbilical arteries</i> and ligaments. Between this part and the os pubis is seen the <i>spermatic cord</i> .		
e. The inferior margin of the upper transversal tendon, who passes behind the rectus, and adheres to the peritonæum.		
f. The inferior lamella of the obliquus internus; between f. and g. is the posterior lamella.		
g. The <i>linea alba</i> , from which the tendon of the obliquus, and the anterior lamella, of the internal obliquus, were dissected. g. <i>Umbilicus.</i>		

Superior extremity.

a. <i>Subscapularis</i> ; from the inner surface of the scapula.	Into the inner protuberance of the os humeri.	To roll the humerus inwards to the side of the body, and to prevent the ligament from being pinched.
b. <i>Teres minor</i> ; from below the scapula.	Into the neck of the humerus.	To draw the humerus backwards.
c. <i>Coraco brachialis</i> ; from the coracoid process.	In the middle of the humerus.	To move forwards and upwards.
d. <i>Brachialis internus</i> ; from the middle of the humerus.	Into the coronoid process of the ulna.	To bend the fore-arm.
e. <i>Brachialis externus</i> , or <i>caput tertium tricipitis</i> ; from the os humeri.	Into the olecranon and the condyles of the humerus.	To extend the fore-arm.
f. <i>Extensor carpi radialis longior</i> ; from the os humeri.	In the bone of the metacarpus.	To extend the hand.
g. <i>Flexor longus pollicis manus</i> ; from the upper part of the radius and condyle.	Into the last joint of the thumb.	To bend the last joint of the thumb.
h. <i>Flexor profundus perforans</i> ; is divided in four tendons, passing under the annular ligaments of the wrist, to the third bones of the fingers.		
i. <i>Pronator radii quadratus</i> ; from the inferior inner part of the ulna.	To the lower part of the radius.	To turn the radius together with the hand inwards.
k. <i>Adductor metacarpi minimi digiti</i> ; from the os unciforme.	Into the metacarpal bone of this finger.	To bring the finger toward the rest.
l. <i>Unus lumbricalium</i> ; the other three appear also along the tendons of the flexor profundus, and under them are the <i>interossei interni</i> .		

The inferior extremity.

a. <i>Gluteus minimus</i> ; from the spinous process of the ilium.	Into the back part of the trochanter major.	To pull the femur outwards and backwards.
b. <i>Iliacus internus</i> ; from the transverse processes of the vertebrae in the loins.	Into trochanter minor femoris.	To bend the thigh, &c.
Inward, between b. and c. is the <i>psoas magnus</i> .		
d. <i>Adductor brevis femoris</i> ;	} from the os pubis.	To bring the thigh inwards.
e. <i>Adductor magnus</i> ;		
f. <i>Gracilis</i> ; from the os pubis.	Into the tibia under the sartorius.	To bend the leg.
g. <i>Caput bicipitis flexoris cruris</i> ; from the os ischium.	Behind into the fibula.	As the former.
h. <i>Peronæus longus</i> ; from the fore part of the fibula.	Into the outside of the metatarsal bone.	To move the foot outwards.
i. <i>Peronæus brevis</i> ; from the upper part of the fibula.	Into the second phalanx.	To bend the four toes.

Between the peronæus and tibia is to be seen the *tibialis posticus*.

k. The tendon of the *tibialis posticus*, covering the tendon of the *flexor longus digitorum pedis*.

l. *Extensor brevis digitorum pedis*; from the fore part of the os calcis. Into the next toes. To extend the toes.

PLATE XIV. *The third layer of muscles on the back part of the body.*

Head and neck.

Name and origin.	Insertion.	Action.
a. Part of the buccinator.		
b. <i>Complexus</i> ; from six vertebræ of the neck and three of the back.	Under the splenius muscle.	To bend the head backwards.
c. <i>Trachelo-mastoideus</i> ; from the sternum and clavicle.	Into the mastoid process.	To bend the head forwards.
d. <i>Scalenus medius</i> ; from the clavicle and two ribs.	Into the sides of the vertebræ of the neck.	To bend the neck forwards.
e. <i>Scalenus posticus</i> .		

The Trunk.

a. <i>Spinalis dorsi</i> ; and below it the <i>multifidus spinæ</i> .	Into all the vertebræ of the back.	To bring the back backwards.
b. <i>Longissimus dorsi</i> ; from the os sacrum and ilium.		
c. <i>Sacro lumbaris</i> ; as the former.		
d. <i>Semi spinalis dorsi</i> ; from the os sacrum and vertebræ of the loins.	Into the vertebræ of the loins.	To contain and compress the abdomen, to expel the fæces, to facilitate the respiration.
e. <i>Transversalis abdominis</i> ; from the sides of the vertebræ in the loins.	Into the linea alba.	

The superior extremity.

a. <i>Teres major</i> ; from the lower part of the scapula.	Into the upper part of the humerus.	To bring the humerus downwards.
b. <i>Pars coraco brachialis</i> ; from the coracoid process.	In the middle of the os humeri.	To raise the humerus.
c. <i>Pars coraco brachialis interni</i> ; from the humerus under the deltoid muscle.	Into the upper part of the ulna.	To bend the fore-arm.
d. <i>Caput tertium tricipitis extensoris cubiti</i> ; from the neck of the scapula.	Into the olecranon.	To extend the fore-arm.
e. <i>Extensor radialis longior</i> ; from the internal condyle of the humerus.	In the carpus near the thumb.	To bend the wrist.
f. <i>Extensor radialis brevior</i> ; from the external condyle of the humerus.	Into the bones of the metacarpus.	To extend the carpus.
g. Part of the <i>flexor profundus perforans</i> ; from the upper part of the ulna.	Into the third joint of the fingers.	To bend the fingers.
h. <i>Supinator radii brevis</i> ; from the upper part of the ulna.	Into the upper part of the radius.	To roll the arm outwards.
i. <i>Pars adductor pollicis</i> ; from the metacarpal bone, that sustains the middle finger.	In the inner part of the root of the first bone.	To pull the thumb towards the fingers.
k. One of the <i>three interossei externi</i> ; from the sides of the metacarpal bones.	In the first joint of the fingers.	To bring the fingers toward the thumb.
l. The tendons of the <i>extensores digitorum</i> , jointly with the <i>lumbricales</i> , and <i>interossei</i> , forming the tendinous expansion in the posterior part of the four fingers.		forming the tendinous expansion in the posterior part of the four fingers.

The inferior extremity.

a. <i>Gluteus minimus</i> ; from the ilium near the acetabulum.	Into the trochanter major.	To extend the femur.
b. <i>Obturator internus</i> ; from the inner side of the foramen pubis.	Near the trochanter major..	To roll the femur.
c. <i>Semi membranosus</i> ; from the ischium.	In the internal side of the tibia.	To bend the leg.
d. <i>Caput breve bicipitis flexoris cruris</i> ; from the ischium and femur.	On the posterior part of the fibula.	To bend the leg.
e. <i>Triceps magnus</i> ; from the os pubis and ilium.	Into the spine of the os femoris.	To turn the femur outwards.
f. <i>Gracilis</i> ; from the fore part of the os pubis.	Into the ham.	To bend the femur.
Under the ham is the origin of both the <i>gastrocnemii externi</i> and <i>plantaris</i> .		
g. <i>Popliteus</i> ; from the external condyle of the thigh.	Into the tibia under the ham.	To turn the tibia outwards.
h. <i>Tibialis posticus</i> ; from the interosseus ligament.	Into the external bone of the metatarsus.	To bend the foot outwards.
i. <i>Flexor longus digitorum pedis</i> ; from the back part of the tibia, below its head, and divides into four tendons.	Into the extremity of the last joint of the four lesser toes.	To bend the last joint of the toes.
k. <i>Flexor pollicis longus</i> ; from the back part of the fibula.	Into the last joint of the great toe.	To bend the last joint of the great toe.
l. <i>Peroneus longus</i> ; from the fore part of the peroné.	Into the outside of the os metatarsis.	To bend the foot.
m. <i>Extensor brevis digitorum pedis</i> ; arises from the fore part of the os calcis.	Into the upper part of the toes, except the little one.	To extend the toes.

PLATE XV. *Fourth series of muscles in the anterior part of the body.*

Name and origin.	In the head and neck.	Insertion.	Action.
a. <i>Levator palpebræ superioris</i> ; in the bottom of the orbit.	In the cartilage of the tarsus.		Raises the palpebra.
b. <i>Obliquus superior, vel trochlearis</i> ; nearest to the optic foramen.	Passes the trochlea, and is implanted in the bulb of the eye near the rectus externus.		Gyrates the bulb round, and draws it inwardly.
c. <i>Attollens rectus oculi, vel superbus</i> ; from the superior part of the foramen opticum.	In the tunica sclerotica.		Moves the bulb of the eye upwards.
d. <i>Adductor rectus, vel bibitorius</i> ; between the obliquus superior and depressor.	In the external canthus of the eye.		Bends the bulb towards the nose.
e. <i>Abductor vector, vel indignabundus</i> ; between the foramen, opticum, and lacerum.	In the internal canthus.		Draws the bulb towards the ear.
f. <i>Depressor rectus, vel humilis</i> ; from the inferior part of the optic foramen.	In the inferior part of the tunica sclerotica.		Draws the eye downwards.
g. <i>Obliquus inferior, seu parvus</i> ; nearest to the orifice of the osseous lachrymal canal.	In the posterior lateral part of the sclerotica.		Moves upwards, downwards, and inwardly.
h. <i>Pterygoideus internus</i> ; from the pterygoid process of the os palatum.	In an angle of the lower jaw.		Draws the maxilla upwards and to the side.
i. <i>Obliquus superior capitis</i> ; from the first vertebra of the neck.	In the bone of the occiput near the mastoid process.		Draws back and retracts the head.
j. <i>Longi colli</i> ; from the three superior vertebræ of the neck, and from the 3, 4, 5, 6, processes of the vertebræ of the neck.	Into all the vertebræ of the neck.		Turn the head anteriorly, backward, and obliquely.
k. <i>Scaleni medii</i> ; from the processes of the neck.	Chiefly in the dorsal ribs.		Turn backward and obliquely.
l. <i>Intertransversarii</i> ; from the processes of the vertebræ of the neck, and first of the back.	To the musculus longissimus dorsi.		Draw back the neck.

Muscles in the breast and abdomen.

a. <i>Levatores costarum primarum</i> . Fibres run down obliquely, although between the ribs from the extremity of the eleven uppermost ribs and last of the neck.	From one rib to another the muscles climbing over the next rib are at length inserted in the subsequent.	They strengthen the beginning of the first rib, assisted by others they elevate the rest.
b. <i>Intercostales externi</i> . c. The first. d. <i>Intercostales interni</i> . e. The first. f. <i>Diaphragm</i> . g. A part laying towards the abdomen. h. Which looks towards the thorax. i. A foramen from which the œsophagus goes out.	In the vertebræ of the loins and last rib.	Moves the lumbs, and bends them obliquely.
k. <i>Quadratus lumborum</i> ; posteriorly from the os ilium.	In the juncture of the os ilium and pubis.	Bends the femur.
l. <i>Psoas parvus</i> ; from the lumbar vertebræ.	In the little trochanter and beneath.	They bend the femur anteriorly and incurve the back.
m. <i>Psoæ magni</i> ; from the lumbar vertebræ and last of the dorsal.	They are inserted jointly with the psoæ into the trochanter.	Bend the femur.
n. <i>Iliaci interni</i> ; from the os ilium in the pelvis.	In the great trochanter.	They rotate the femur.
o. <i>Obturator externi</i> ; from the internal side of the pubis.	Into the corpora cavernosa.	They serve for erection.
p. <i>Erectores penis</i> ; from the os ischium.	It is connected to the os coccygis, intestinum rectum,	Closes the anus, restrains the faces.
q. <i>Sphincter externus ani</i> ; is an orbicular muscle in the intestinum rectum.	bulb of the urethra, and internal sphincter.	

Muscles in the superior extremity.

a. <i>Scapulares</i> . b. <i>Supinator brevis</i> . c. <i>Pronator quadratus</i> .		
d. <i>Flexor brevis pollicis</i> ; from the bones of the carpus.	In the first bone of the pollex and os sesamoideum.	Bends the pollex, or thumb.
e. <i>Adductor pollicis</i> . f, g, h, i, k, l, m. <i>Interossei interni & externi</i> ; from the bones of the metacarpus; are inserted into the first joints of the adjoining fingers; they draw in the fingers.		

Muscles in the inferior extremity.

a. <i>Adductores magni femoris</i> . b. <i>Tibiales postici</i> . c. <i>Peronei breves</i> . d. <i>Interossei primi digitorum secundorum</i> . e. <i>Interossei secundi digitorum secundorum</i> . f. <i>Interossei secundi digitorum tertiorum</i> . g. <i>Interossei secundi digitorum quattorum</i> .		
h. <i>Adductor pollicis</i> .		

PLATE XVI. *The fourth series of muscles in the posterior part of the body.*

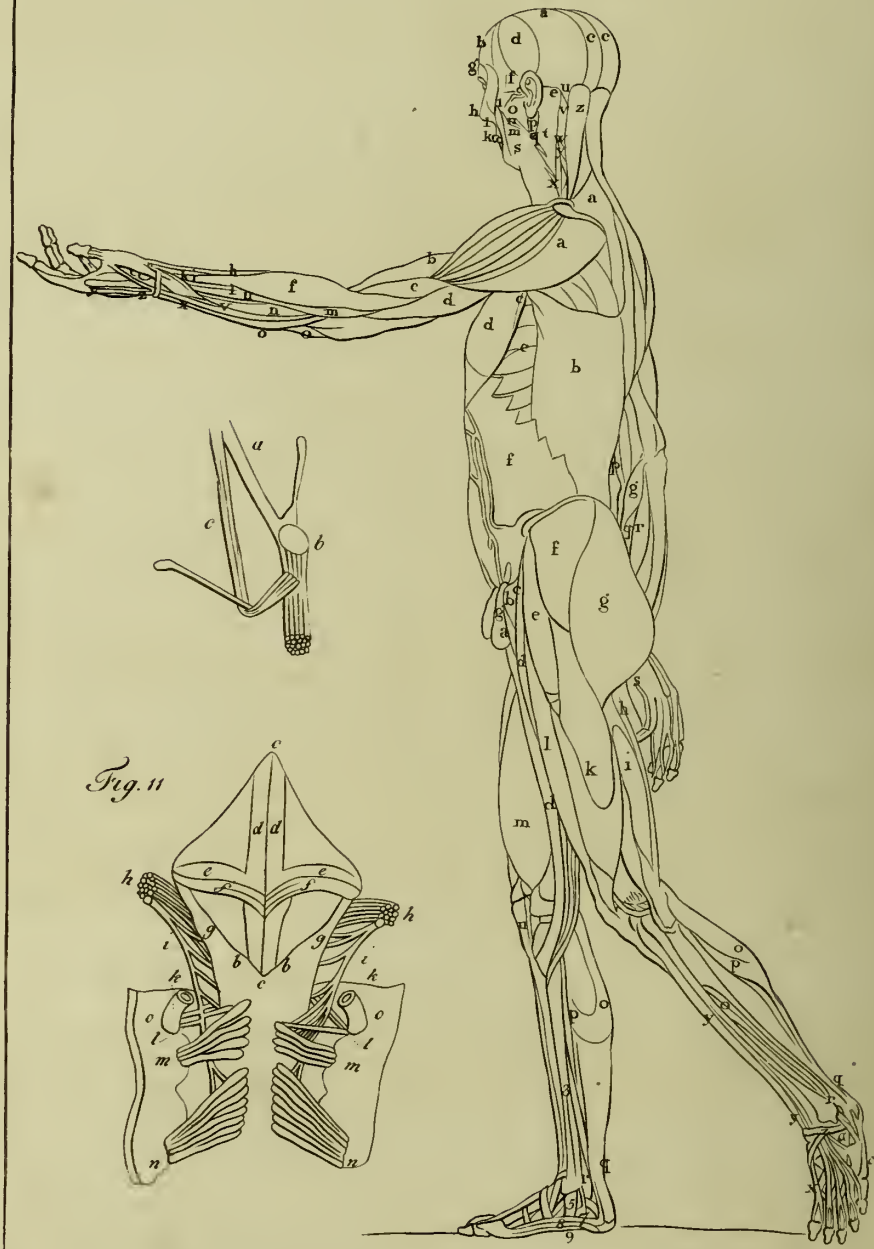
Name and origin.	Head and neck.	Insertion.	Action.
a. <i>Recti postici minores</i> ; from the first vertebra of the neck.	Near the great foramen of the occiput.	They move the head backwards.	
b. <i>Recti postici majores</i> ; from the second vertebra of the neck.			
c. <i>Obliqui superiores</i> ; from the transverse process of the first vertebra.	In the os occipitis behind the mastoid process.	They rotate the head.	
d. <i>Obliqui inferiores capitis</i> ; from the second vertebra of the neck.	Into the process of the first vertebra of the neck.		
e. <i>Infra spinales cervicis</i> ; between the processes of the neck.	The muscle arising from the superior vertebra goes to the inferior.	They erect the neck and processes proprius adducunt.	
f. <i>Scaleni medii quinque.</i> g. <i>Intertransversarii colli quinque.</i>			
<i>The trunk.</i>			
a. <i>Levatores breviores</i> of the twelve ribs, from the transverse processes of the first eleven vertebrae of the back, and of the last of the neck.	From one superior rib they run down to the next inferior.	They strengthen the beginning of the first rib, and by means of other muscles elevate the rest.	
b. <i>Levatores longiores</i> are proper to the four inferior ribs.	They run from one rib to another, where they are inserted.	They elevate the ribs, and draw them backwards.	
c. <i>Intercostales externi.</i> d. <i>Intercostales interni.</i>			
e. <i>Pleura</i> consists of a double membrane, surrounds the whole cavity of the thorax, and every where firmly adheres to it.			
f. <i>Intertransversarii dorsi</i> , in the space between the two processes.	Connect the superior to the inferior process.	They draw in the transverse processes.	
g. <i>Semispinales dorsi</i> , from the transverse processes of the 7, 8, 9, 10th dorsal vertebrae.	In the spinal processes of the dorsal vertebrae.	They extend the spine obliquely and backwards.	
b. <i>Spinales cervicis</i> , from the six superior dorsal vertebrae.	In the spinal processes of the vertebrae of the neck.	Extend the neck obliquely and backward.	
i. <i>Multifidus spinæ</i> , from the os sacrum and ilium, and transverse processes of the loins of the back and neck.	Into all the spinal processes of the vertebrae of the loins, back, and neck.	They move the back obliquely and backward.	
k. <i>Interspinales dorsi</i> ,	{ from the spinal processes of the back and loins.	They draw together the processes.	
l. <i>Interspinales lumborum</i> ,			
m. <i>Intertransversarii lumborum</i> , from the transverse processes.	They fill the spaces between the transverse processes.	They draw the lumbar vertebrae.	
n. <i>Quadratus lumborum.</i> o. <i>Diaphragm.</i> p. <i>Psoæ.</i> q. <i>Iliaci.</i>			

Muscles in the superior extremity.

- a. *Subscapulares.* b. *Supinators.* c. *Pronators teretes.* d. *Flexores breves.* e. *Adductores pollicis.*
 g. i. k. l. m. *Interossei.*

Muscles in the inferior extremity.

- a. Tendons common to the *psoæ magnæ* with the *iliaci interni.* In the minor trochanter of the os femoris and below. They bend the body and the femur anteriorly.
- b. *Obturator externus*, from the os pubis and ischium, and from the margin of the oval foramen. In the base of the large trochanter of the femur. It bends the femur inward, and rotates outward.
- c. *Adductor magnus*, from the symphysis of the pubis and ischium. In the linea aspera, and below the condyle of the os femoris. Moves the femur upwards, inwards, and rotates it outwards.
- d. *Tibiales postici.* e. *Peronei.*
- f. *Interossei 3 inferiores*, they draw the first phalanx of the digiti towards the pollex, great toe.
- g. *Transversales pedis*, from the fifth bone of the metatarsus, and from the plantar aponeurosis. In the sesamoid bone and adductor pollicis. It draws the thumb to the fingers.
- h. *Adductor pollicis*, beneath the 4th, 3d, and 2d os metatarsi. In the sesamoid bone, and first bone of the phalanx of the pollex. It draws the pollex, or thumb.



The Letters of the 11 Fig. were omitted in Tab. XXVIII.

PLATE XVII. *First class of muscles situated on the lateral part of the body.*

Of the head and neck.

a. b. c. Epicranii. b. Frontalis. c. Occipitalis. d. e. f. Muscles of the ear. d. Attollens. c. Retrahens. f. Anterior. g. Orbicularis palpebrarum. h. Compressor naris. i. Nasalis labii superioris. k. Orbicularis oris. l. Zygomaticus major. m. Depressor anguli oris. n. Buccinator. o. Malleter. p. Pterygoideus externus. q. Stylohyoideus. r. Styloglossus. s. Latissimus colli. t. Sterno mastoideus. u. Biventer cervicis. v. Splenius capitis. w. Splenius colli. x. Scalenus medius. y. Levator scapulæ. z. Cucullares.

Of the trunk.

a. Cucullares. b. Latissimus dorsi. c. Serratus anticus. d. Pectoralis. e. Serratus magnus. f. Obliquus externus abdominis. g. Cremaster.

Of the superior extremity.

a. Deltoïdes. b. Biceps. c. Brachialis internus. d. Triceps. e. Ulnaris internus. f. Supinator longus. g. Pronator teres. h. Radialis internus. i. Sublimis. k. Flexor longus pollicis. l. Tendo radialis externi longioris alterius. m. Radialis externus longior. n. Radialis externus brevior. o. Ulnaris externus. p. Supinator longus. q. Radialis internus. r. Sublimis. s. Flexor longus pollicis. t. Tendo radialis externi longioris alterius. u. Radialis externus longior. v. Radialis externus brevior. w. Extensor communis digitorum manus. y. Indicatoris tendo. z. Extensor proprius digiti articularis. a. Abductor longus pollicis. b. Extensor minor pollicis. c. Tendo extensoris longi pollicis. d. Communis tendo extensoris majoris et minoris pollicis. e. Ligamentum armillare exterius. f. The ligament which binds the tendons of the abductor longus and the extensor minor pollicis. g. Ligamentum interlus carpi. h. Abductor brevis pollicis. i. Opponens pollicis. k. Abductor pollicis. l. Abductor indicis. m. Lumbricales. n. Interossei. o. Palmaris brevis. p. Flexor brevis minimi digiti. q. Abductor minimi digiti. r. Adductor ossis metacarpi quarti.

Of the inferior extremity.

a. Abductor longus femoris. b. Pectineus. c. Psoas magnus. d. Sartorius. e. Tensor vaginæ femoris. f. Glutæus medius. g. Glutæus magnus. h. Semitendinosus. i. Biceps cruris. k. Vastus externus. l. Rectus cruris. m. Vastus internus. n. The ligament joining the patella to the tibia. o. Gemelli. p. Solæus. q. Tendo Achillis. r. Tendo plantaris. s. Peronæus longus. t. Ligament belonging to the peronæus longus. u. Peronæus brevis. v. Ligament belonging to the peronæus brevis. w. Extensor longus digitorum. x. Tendon of the extensor proprius pollicis. y. Tibialis anticus. z. The ligament on which the tendons on the side of the leg and back of the foot are spread. a. Extensor brevis digitorum. b. Interossei. c. Abductor minimi digiti. d. Flexor brevis digiti minimi.

Peculiarities of the right inferior extremity.

1. Flexor longus pollicis. 2. Ligament by which the tendon of this muscle is tied down. 3. Flexor longus digitorum. 4. Tendon of the tibialis posticus. 5. Ligament which lies over the tendons of the flexor longus digitorum pedis and tibialis posticus. 6. Ligament which confines the tendon of the tibialis anticus. 7. Abductor pollicis. 8. Flexor brevis pollicis. 9. Flexor brevis digitorum.

PLATE XVIII. *Of various muscles.*

Figure I. *Of the eye.*

a. The bulb. *b.* The optic nerve. *c.* The trochlear, or obliquus superior muscle. *d.* The trochlea with part of the os frontis. *e.* Obliquus inferior. *f.* Levator oculi. *g.* Depressor oculi. *h.* Adductor oculi. *i.* Abductor oculi.

Figure II. *Muscles of the anterior part of the cartilage of the ear.*

<i>Name and origin.</i>	<i>Insertion.</i>	<i>Action.</i>
<i>a. Helicis major</i> , from the acute process of the helix.	Inserted on the outer part of the helix.	These two muscles appear to be of use to extend the cartilage of the ear, that sounds may be more distinctly heard
<i>b. Helicis minor</i> , from the inferior and anterior part of the helix.	Into the edge of the helix.	
<i>c. Tragicus</i> , from the middle and outer part of the concha, near the root of the tragus.	Into the anterior part of the tragus.	To extend the tragus.
<i>d. Antitragicus</i> , from the external part of the antitragus.	Into the tip of the concha in the fissure itself of the cartilage of the ear.	To dilate the mouth of the concha.

Figure III. *Muscles on the posterior part of the cartilage of the ear.*

a. Transversus auris, arises opposite to the outer side of the antihelix and scaphæ.

Muscles of the internal ear.

<i>Laxator tympani</i> ; from the superior and internal part of the tympanum.	Into the handle of the malleus.	All these muscles are employed in the action of hearing, to convey and moderate sounds.
<i>Externus mallei</i> ; from the extremity of the spinous process of the sphenoid bone.	Its tendon is inserted into the long process of the malleus.	
<i>Tensor tympani</i> ; from the cartilaginous extremity of the Eustachian tube.	By its tendon into the small orifice of the osseous canal.	
<i>Stapedius</i> ; from the little cavern of the os petrosus.	By its tendon into the posterior part of the stapes.	

Figure IV. *Muscles on the posterior part of the larynx and pharynx.*

a. Upper part of the membrane of the pharynx. *b.* The trachea taken from its situation. *c.* The œsophagus cut off. *d.* The interior transverse fibres of the œsophagus. *e.* The exterior fibres descending obliquely backwards. *f. Constrictor inferior* pharyngis. *g. Constrictor medius* pharyngis. *h. Cornu ossis hyoidis.* *i. Constrictor superior* pharyngis. *k.* That part of it, which unites with the buccinator. *l. Stylo pharyngeus.*

Figure V. *Connection of the levator ani, with the intestinum, rectum, and urethra.*

a. Urethra. *b. Bulb of the urethra.* *c. Sphincter internus.* *d. Levator ani.*

Figure VI. *The corpora cavernosa of the penis and urethra, the acceleratores urinæ, transversales & erectores penis.*

a. The corpus cavernosum of the penis cut off. *b.* The corpus cavernosum of the urethra separated. *c. Erector penis.* *d. Accelerator urinæ.* *e. Transversalis penis alter.*

Figure VII. *Of the sphincter ani and bulb of the urethra.*

a. The urethra and corpus cavernosum. *b.* The bulb. *c.* Part of the sphincter ascending obliquely. *d.* The angular part which is inserted into the perinæum.

Figure VIII.

a. The anterior part of the anus. *b.* Its origin from the spinous process of the os ischiini. *c.* The posterior part, which appears to be external. *d.* Its insertion into the os coccygis. *e.* The internal sphincter ani. *f. Anus.*

Figure IX.

a. Insertion of the sphincter into the os coccygis. *b.* The anus.

Figure X. *Muscles of the internal part of the hand.*

1. Abductor pollicis. *2.* Adductor pollicis. *3.* Flexor brevis. *4.* Quadratus, or palmaris brevis. *5.* Ligament of the carpus. *6.* Abductor minimi digiti. *7.* Probe passed under the tendons of the perforati. *8.* Probe passed under the tendons of the perforans. *9.* Lumbricales. *10.* Perforatus. *11.* Flexor carpi radialis. *12.* Flexor carpi ulnaris.

Figure XI. *Muscles on the back of the foot.*

1. Tendo Achillis. *2.* Part of the astragalus which corresponds with the tibia. *3.* The tendon of the tibialis anticus. *4.* Tendon of the extensor pollicis pedis longus. *5.* Tendons of the extensor communis digitorum. *6.* Extensor pollicis pedis brevis. *7.* Extensor digitorum brevis. *8.* Communication of the tendons of the extensor longus, and extensor brevis.

PLATE XIX. *The anterior arteries of the body.*

a. The heart.

b. The *aorta*; it arises from the left ventricle of the heart, gives off the coronary arteries, and makes the great arch towards the dorsal vertebra, then descends through the opening of the diaphragm into the abdomen, in which it proceeds near the left side of the back to the last vertebra of the loins, and there is divided into the two iliac arteries.

c. The *coronary arteries*; they arise from the aorta under its arch, and are distributed into the substance of the heart and auricles.

d. The *great arch*; it gives off three branches: 1. the *arteria innominata*. 2. The *left carotid*. 3. The *left subclavian*.

e. The *arteria innominata*; it arises from the arch of the aorta, is immediately divided into two branches; *g.* the right subclavian, and *h.* the right carotid.

The carotid arteries ascend in a straight line to the larynx, and are there divided into the external and internal.

The external carotid ascends by the ear to the temples, and ramifies into eight branches: 1. the superior thyroid; 2. the sublingual; 3. the inferior maxillary; and 4. the external maxillary; 5. the pharyngeal artery; 6. the occipital; 7. the external auditory; and 8. the temporal, from which arises the frontal.

The internal carotid in the cavity of the cranium gives off the cerebral branches.

i. The *left subclavian*.

The subclavian arteries near the clavicles are inflected outward, like an arch into the submaxillary cavity, where they are called the submaxillary arteries.

The subclavian artery gives off four branches.

1. The *internal mammary*; it descends near the sternum, and sends forth, 1. the *arteria mediastina*; 2. the *thymic A.* 3. the *pericardic*, from which arises the superior diaphragmatic; and 4. the inferior tracheal.

2. The *cervical*; it goes to the muscles of the neck.

3. The *vertebral*; it ascends through the seven foramina of the transverse processes of the neck, and enters the cavity of the cranium.

4. The *superior intercostals*; they run on the inferior margin of the ribs to the sternum.

k. The *axillary artery* gives off four branches: 1. the external mammary; 2. the inferior thoracic; 3. the external and internal scapular; 4. the humeral, then

l. The *brachial artery*; it runs under the arm to the bend of the elbow, and is divided into three branches.

m. 1. The *cubital artery*, runs down near the elbow, arrives at the palm of the hand, and there forms the palmary arch.

n. 2. The *radial artery*, descends along the radius into the palm of the hand.

3. The *interosseal artery*, external and internal, are distributed to the muscles of the fore-arm.

o. The *palmary arch*; from this arise the four digital arteries.

The branches of the aorta descend.

The aorta from the arch to the diaphragm gives off

four branches; 1. the bronchial artery; 2. the *oesophageal*; 3. the eight pairs of intercostals; 4. the inferior diaphragmatic arteries.

a. The *bronchial artery*; going to the bronchiæ and pulmonary vessels.

The *oesophageal artery* goes to the inferior part of the *oesophagus*.

The *inferior intercostals* go to the sternum along the inferior margin of the eight lower ribs.

The *inferior diaphragmatic arteries* go into the diaphragm.

The aorta sends off eight branches in the abdomen.

b. 1. The *coeliac*, which is solitary; under the stomach it is divided into three branches; 1. The *arteria stomachica*; 2. The *splenic A.* 3. The *hepatic*.

c. 2. The *superior mesaraica A.* it tends towards the jejunum, cœcum, and right colon.

d. 3. The *renal arteries*, which go to the kidneys.

e. 4. The *spermatic arteries*; they go to the testicles in men, but in women to the ovaria.

f. 5. The *inferior mesenterica*; it goes to the left colon, and to the rectum.

g. 6. The *lumbal arteries*; which go to the muscles of the loins and abdomen.

b. 7. The *sacral*; they pass near the os sacrum.

z. 8. The *iliac*; near the last vertebræ of the loins the aorta is divided into two.

The *iliac arteries* are divided into *external* and *internal*.

The *internal iliac artery* is called the *hypogastric*; in the fœtus it divides itself into six, in the adult into five branches, which are divided within and without the pelvis.

k. The *external iliac*; it comes out of the cavity of the pelvis under Poupart's ligament, and runs backward into the internal part of the thigh to the subpopliteal cavity.

l. In this course it is called the *crura* or *femoral artery*, and under the ham the *subpopliteal*.

m. The *external iliac artery*; at its exit from the pelvis it gives off the *epigastric*, which ascends under the rectus muscle to the sternum.

n. The *crural artery*, gives many muscular branches to the muscles of the thigh and lateral arteries, which anastomose with the *recurrent genual arteries* from the tibial.

o. The *popliteal artery*, is divided into the *anterior* and *posterior tibial*, and the *peroneal*.

p. The *anterior tibial artery* perforates the interosseal ligament, descends to the back of the foot, (penes pollicem pedem perforat) and runs into the sole of the foot.

q. The *posterior tibial* descends in the internal and posterior part of the tibia.

r. The *peroneal*, or *fibular artery*, descends behind the fibula, perforates the inferior part of the interosseal ligament, and runs on the back of the foot.

The *plantary arch* is formed by the anterior and posterior tibial, and the peroneal, in the sole of the foot.

The *digital arteries* (of the foot) arise from the plantary arch.

PLATE XX. *The posterior arteries of the body.*

<i>Name, origin, trunks.</i>	<i>Branches.</i>	<i>Terminations.</i>
a. <i>The occipital artery</i> ; emerges under the splenic muscle.	Is distributed through the occiput.	Sends forth branches to the rectus, oblique, complex muscles, &c.
b. <i>The posterior auricular</i> ; a branch of the temporal.	Often arises from the occipital artery.	In the posterior muscles of the ear, the biverter, mastoideus; &c.
c. <i>The dorsalis suprema</i> ; mostly from the thyroid artery. The branches are,	1. Scapularis; 2. spinalis; 3. dorsalis scapulae.	To the trapezius, splenius, coraco-hyoideus, &c.
d. <i>The occipital arch.</i>	Formed by the union of the branch of the opposite side.	Makes anastomosis.
e. <i>The superior intercostal A.</i>		In the adjoining periosteum of the vertebra.
f. <i>The intercostal aortic arteries</i> ; nine pair from the descending aorta.	The first arises between the third and fourth vertebra of the neck. The ninth under the 11th rib.	Sends off the A. broncheal; A. the dorsal of the second & third.
They separate near the head of the rib into two branches.	1. The dorsal branch; 2. The intercostal branch, which continually divides and again unites.	In the back and spinal marrow.
g. <i>The lumbar arteries</i> ; arise from the aorta almost at right angles	They have a simple trunk.	Anastomose with the abdomen and epigastric artery.
b. <i>The trunk of the axillary artery</i> ; arises from the subclavian.	It bifurcates into the humeral and brachial arteries.	It nourishes the os humeri and its muscles.
i. <i>The inferior scapular A.</i> from the subclavian; often from the scapularis interna.	Is distributed all through the scapula.	Goes to the long extensor and infra-spinal muscles, &c.
k. <i>The posterior circumflex A.</i> from the axillary A.		To the head of the humerus, deltoid, extensor longus, &c.
l. <i>The trunk of the humeral A.</i> from the axillary, often from the brachial artery.	Nourishes the muscles of the scapula and humerus.	Is changed into the radial and ulnar arteries.
m. <i>The profunda humeri</i> ; from the humeral artery.	Follows the linea aspera of the humerus.	To the short and long extensors, to the skin; &c.
n. <i>The posterior and superior interosseous artery.</i>	Branches; 1. posterior; 2. inferior.	To the extensors of the little fingers.
o. <i>The superior dorsal A. of the scapula</i> ; mostly from the thyroid.	1. <i>The arteria nutritia</i> of the scapula.	In the periosteum of the scapula.
Its principal branches are:	2. <i>The dorsal A.</i>	In the head of the humerus and back of the scapula.
p. <i>The trunk of the axillary artery.</i>	3. <i>The supra-spinalis A.</i>	Upon the spine of the scapula.
q. <i>The posterior circumflex artery</i> ; from the axillary artery.	4. <i>The infra-spinalis A.</i>	Below the spine of the scapula.
r. <i>The arteria profunda of the humerus</i> : from the axillary A, it sends forth many branches.	5. <i>The muscular A.</i>	In the adjacent muscles.
	Passes in the axilla.	In the upper circumflex artery
	Anastomoses with the arteria profunda of the humerus.	To the epiphyses and os humeri.
	1. <i>The superior</i> ; 2. <i>the A. nutritia of the humerus</i> ; 3. <i>the profunda of the radius</i> , &c.	Are distributed to the deltoid medulla of the humerus, radius, skin; &c.
	Sends off many perforating branches.	Into the spinator brevis, the radius, &c.
	1. <i>The median A.</i> 2. <i>the radial</i> ; 3. <i>the carpeo-radial</i> ; 4. <i>the carpeo-ulnar.</i>	The carpal is produced from the anastomosis with other arteries.
z. <i>The radial artery</i> ; from the humeral artery in the top of the humerus, often goes off from the trunk at the bend of the elbow.	1. <i>The cutaneous muscular A.</i> 2. <i>the recurrent radial A.</i> 3. <i>the profunda</i> ; 4. <i>the A. volaris anastomotica</i> , &c.	Are distributed through the metacarpus, carpus, fingers, back of the palm of the hand, it communicates with others
ww. <i>The posterior iliac artery.</i>	Above the pyramidal muscle.	To the pyramidal muscle, &c.
x. <i>The ischiadic artery.</i>	Is variously divided about the tuberosity of the ischium.	1. <i>The hæmorrhoidal A.</i> 2. <i>the arteria pudenda.</i>
y. <i>The popliteal artery</i> is a continuation of the crural under the poples, or ham.	1. <i>The posterior tibial A.</i> 2. <i>the anterior tibial</i> ; 3. <i>the peroneal.</i>	The articular, interosseal, cutaneous, muscular arteries, &c.
z. <i>The anterior tibial artery.</i>	Perforates the interosseous ligament.	Goes down to the back of the foot.
<i>The posterior tibial artery.</i>	Branches: 1. <i>the interior</i> ; 2. <i>the posterior.</i>	1. <i>The posterior tibial A.</i> 2. <i>the peroneal.</i>
a. a. <i>The anterior peroneal artery.</i>	Perforates the interosseous ligament.	Is now called the posterior peroneal.
<i>The posterior peroneal artery.</i>	Descends near the fibula.	Is united with the tibial.



P L A T E XXI. *The veins.*

All the blood of the head, face, and neck.

Is discharged.

The blood driven through the arteries into the cerebrum and cerebellum.

Flows into the sinusses of the dura mater.

a. The *internal jugular veins*; they descend into the neck.

Receive the *thyroid b.* and *internal maxillary veins*.

Veins 1. c. The *frontal*; 2. the *angular*; 3. d. the *temporal*; 4. the *auricular sublingual*; 5. e. the *occipital*.

Descend in the lateral parts of the neck under the common integuments.

f. The *digital veins of the hand*; arise from the extremities of the arteries, through innumerable anastomoses.

Flow into 1. g. the *cephalic vein of the thumb*, and unite with the inferior.

2. Into the *salvarella*; b. this comes to the second finger.

g. The *external radial vein*; runs down the length of the radius.

By its union with the *mediana cephalica minor*.

k. *Veins* 1. The *external and internal cubital*; 2. the *collateral*; 3. the *superior profound veins*.

From the flowing of these veins into the inferior part of the humerus.

m. The *larger cephalic median vein*; 2. the *inferior profunda*; 3. the *internal radial*.

Flow into the flexure of the arm, and become the *vena mediana*.

The *cephalic and basilic veins*.

Unite in the humerus.

n. The *brachial vein*.

Ascends in the internal surface of the humerus to the submaxillary cavity.

o. The *axillary vein*; it receives

1. The *thoracic veins*; the *muscular and scapular*.

p. The *subclavian veins*; are a continuation of the axillary veins, and receive the blood from

1. The *internal jugular veins*,
2. The *external* ———

3. The *vertebral* ———

Both subclavians unite on the right side, and thence convey the blood into the right aurium (i. e. *venous sinus*) of the heart through the vena cava.

4. The *mediastina*; 5. the *pericardic*; 6. the *diaphragmatic*, or *phrenic*; 7. the *internal mammary*; 8. the *laryngeal*; 9. the *superior intercostal*; 10. the *vena azygos*.

q. The *vena azygos*, or *vena sine pari*.

Is composed by the conflux of the following veins:

r. The *digital veins of the foot*; arise from the extremities of the toes.

Are emptied into the *cephalic vein of the great toe* 1. 2. the *saphena u.* and 3. the *dorsal vein of the foot u.*

The *vena plantaris*,
—— *surales*.

Inferius.

x. The *anterior and posterior tibial*.

Unite with the *vena peronea*.

y. The *popliteal vein*; it ascends by the poples.

After it is out of the ham.

z. The *crural vein*; in the pelvis it is called the *external iliac*.

It receives the external pudenta.
Unites with the internal iliac vein.

a. The *vena cava inferior*; begins from the iliac veins to the last vertebra of the loins; near the heart it unites with the *vena cava superior* in the *anterior sinus of the heart*.

In the cavity of the pelvis and abdomen the following veins flow to them.

b. The *internal iliac vein*; receives

1. The *external hemorrhoidal veins*.

2. The *hypogastric veins*.

G

Into the two internal and two external jugular veins.

Is received by the internal jugular veins.

Are emptied into the subclavian veins.

Convey the blood into the external jugular veins, which carry it into the subclavian veins.

Is emptied into the external radial vein.

This flows into the external and internal cubital.

Becomes the *cephalic major*, which adheres to the superior part of the arm.

Is formed the *vena basilica l*.

The median vein unites at one of its ends with the *cephalica magna*, and at the other with the *basilic*.

Run into the brachial vein.

When entered into this cavity it is called the axillary vein.

When it reaches the clavicles it is called the *subclavian vein*.

From the head.
From the external parts of the head.

From the *veins and vertebral sinusses*.

All these come from the internal parts of the thorax and neck.

1. The *bronchial*; 2. the *superior oesophageal*; 3. the *vertebral*; 4. the *superior right intercostals*; 5. the *left inferior intercostals*.

These run into the *anterior tibial vein*.

{ Empty themselves into the posterior tibial vein.
And are then called the *popliteal vein*.

It is called the *crural*, or *femororal vein*.

{ It passes into the *inferior vena cava*.

1. The *sacral*; 2. the *lumbar*; 3. the *right spermatic*; 4. the *renal*; 5. the *hepatic*; 6. the *inferior diaphragmatic*.

Into these flow 1. the *internal pudendal veins*; 2. the *dorsal veins of the penis*; 3. the *obscurator*.

PLATE XXII. *The glands and lacteal vessels.*

Figure I.

- a. A portion of the jejunum.
- b. A branch of the superior mesenteric artery.
- c. c. c. The lacteals conspicuous with their little knots.
- d. An island of lacteals.
- e. A mesenteric gland, receiving the chyle from the vessels spoken of.

f. An oblong gland with a simple ingredient vessel.
 g. A gland consisting of six or seven lymphatic ingredient ducts.

h. The vasa egressientia, vel efferentia, of a gland migrating to another gland of the next order.

The *lymphatic vessels*, when they successively enter many glands, the first gland is then said to be of the first order, or genus; the next one to this, of the second order, or genus; but this division of Winslow is uncertain, and of no use in physiology, it may with propriety be omitted, because one and the same gland may receive from many glands and new vessels of different orders which are not yet called glands.

i. The thoracic duct; there are two, a primary and a secondary one.

k. Part of the aorta descendens.

l. The receptaculum chyli.

A dilatation of the receptaculum is often wanting in men.

Haller says, it is wanting six times in 21. Dead human bodies, in which I have shewn the thoracic duct, I have seen the ampulla, that is, the cistern of the chyle.

m. The trunks of lacteals opening into the receptaculum.

n. The cœliac artery.

o. The emulgent arteries.

p. The inferior mesenteric artery.

q. The iliac arteries.

r. The sacral artery.

s. Some trunks of the abdominal viscera and lower extremities.

t. The thoracic duct arises from the receptaculum.

Figure II.

A little membrane composing a lymphatic vessel visible in a microscope.

a. A membrane of a lymphatic.

b. Small globules dispersed through the membranes.

c. Fibres, or small striæ, resembling small vessels.

Figure III.

The duct of the thoracic tunic visible in the microscope.

a. The exterior tunic of the thoracic duct, consisting of large globules joined together in cluster.

b. The interior tunic conspicuous with like globules, but less.

Figure IV.

An injected gland, filled with mercury from the absorbents only, exhibiting a congeries of convoluted lymphatic vessels.

Figure V.

A gland filled with mercury, injected by the absorbents, in this the cells are very evident.

PLATE XXIII. *The glands and absorbents.*

<i>Name and Situation of the glands.</i>	<i>Inferent vessels.</i>	<i>Efferent vessels.</i>
The <i>tibial gland</i> ; in the middle of the tibia. The <i>popliteal glands</i> ; under the poples. The <i>inferior inguinal glands</i> ; they constitute the seat of pestilential buboes. The <i>superior inguinal glands</i> ; venereal buboes arise in them. The <i>iliac glands</i> ; in the pelvis near the arteries and iliac veins. The <i>mesenteric glands</i> ; are innumerable through the whole mesentery. The <i>renal and atrabiliary glands</i> .	The small vessels cannot be seen by the naked eye, on account of the great exility of their origins. Injections from the trunk to the lesser vessels do not penetrate, the valves oppose them: mercury easily proceeds from the small trunks to the larger vessels, and points out the way. In the ends of the toes. In the parts situated under the knee. The crural vessels swell when pus is absorbed from ulcers of the foot. The vessels come from the genitals and nates. Receive the lymph from the inferior parts and from the pelvis. Receive the lymph from the lower extremities, intestines, &c. From the kidneys and atrabiliary capsules. Is composed of two trunks of absorbents and one of the lacteals within the diaphragm. Receives the chyle and lymph of the abdomen and lower extremities from the receptacle.	The small vessels united with others make branches, by the union of many of which they become trunks, which at length are terminated in the thoracic duct and subclavian veins, where they empty their chyle and lymph. Are emitted to the popliteal glands. Proceed to the inguinal glands. These vessels go to the iliac region and its glands. These vessels proceed as the above. Promote lymph ad superiora. Go into many trunks, and thence to the thoracic duct. Go to the receptaculum chyli. Where its dilatation ends, it is called the thoracic duct. Perforates the diaphragm, ascends the thorax, exonerates itself in an angle of the left subclavian and jugular veins. This duct empties itself into the right subclavian and jugular vein.
The <i>receptaculum chyli</i> , or ductus Pecquetianus, discovered by John Pecquet, 1649. It is often wanting. The <i>primary thoracic duct</i> ; is the principal trunk of the absorbent system. The <i>right absorbent, or secondary duct</i> ; arises from four large lymphatic trunks. The <i>glands of the stomach, or gastric glands</i> ; are four or six.	The lymph comes from the right side of the liver, diaphragm, heart, lungs, head, &c. They are 1. The coronary vessels. 2. The left gastric. 3. The right gastric.	Go to the thoracic duct. Unite with the lymphatics of the omentum, spleen, and pancreas. They flow with the pyloric of the omentum and liver. They send the lymph to the pericardiac glands. Both flow and enter the thoracic duct. Empty themselves in the thoracic duct, or subclavian veins. They tend to the axillary glands, or the thoracic duct.
The <i>hepatic glands</i> ; a great plexus near the vena portæ. The <i>cardiac, or pericardiac glands</i> ; near the rise of the carotid artery. The <i>glands of the lungs</i> ; are rarely found in the substance of the lungs. The <i>brachial glands</i> ; in the flexure of the arm.	The vessels on the liver are distinguished by several divisions. 1. The right coronary vessels of the heart; 2. the left. Receive the lymph from the lungs. 1. The <i>basilic</i> vessel in the hand, from the palm and little finger; 2. the <i>cephalic</i> from the pollex and index; 3. the <i>median</i> from the other fingers. The vessels come from the head, neck, arms, scapula, breasts, heart, lungs, and liver.	On the left side they are exonerated in the primary or superior trunk; on the right side they are emptied into the secondary or inferior trunk. They descend to the neck, and unite with other cervical trunks. Two trunks, a right and left, flow into the subclavian veins.
The <i>axillary glands</i> ; under the clavicle and in the axilla; they swell from a cancer of the breast.	Several vessels come from the internal canthus of the eye, from the nose and lips. The vessels come from the external and internal parts of the head and neck.	
The <i>glands in the face</i> ; near the zygomatic process and parotid glands.		
The <i>cervical glands</i> ; are very many; are the seat of scrophula and struma.		

PLATE XXIV. *Basis of the Cranium.*

A. *Tentorium cerebelli*, or tentorium of the brain; the part which comes to the anterior clinoid processes is removed.

B. The *longitudinal sinus* of the dura mater. The posterior end is bifurcated; the interior and duplicated lamina of the dura mater, which form the falxiform process; the lateral processes and falx of the cerebellum has peculiar cavities, which are called *sinuses*.

The conjunction of the four greater sinuses is called *torcular of Herophilus*; the *longitudinal sinus* to the end, for the most part, is a continuation of the other sinus in the right transverse process; to which the other sinus is joined belonging to the left transverse process; these are called *lateral sinuses*. In that place, in which the longitudinal sinus is changed into the right lateral, another sinus is opened for a process of the cerebellum, which is called *occipital*; then another, which runs into the same place from the interior parts of the cerebrum, venous, as it were, in its nature, and is called the *fourth sinus*, &c.

C. The *fourth bifurcated sinus*; inserted into the right transverse crus, and into the left other crus; yet this is very rare.

D. The remaining part of the *falx cerebri*.

E. E. The great veins of the tentorium.

F. The veins of the cerebrum inserted by transverse sinuses in the tentorium cerebelli.

G. The opening of the posterior occipital sinus.

H. H. The right and left posterior *occipital sinuses*.

I. *Falx cerebelli*; placed between the two lobes of the cerebellum.

K. K. The *great transverse*, or two *lateral sinuses*.

L. L. The *jugular fossæ*, or depressions: into these fossæ, besides the transverse, petrosæ, and occipital sinuses, are usually inserted the vertebral veins sent into the great jugular sinus by a peculiar meatus of the occipital bone, as also other veins from the occipital dura mater, and frequently the mastoid.

M. M. The *inferior petrous sinuses*; two inserted into these fossæ.

N. N. The *superior petrous sinuses*; two ascend on either side near the root of the petrous bone, and are inserted into the receptacula and jugular fossæ.

O. O. The veins inserted into these sinuses of the cerebellum.

P. P. The *anterior and inferior occipital sinuses*.

Q. Q. *Emissarium* exsert with a nerve of the ninth pair. *Emissaria* are small veins, &c.

R. R. *Anterior and superior occipital sinus*; perpetual.

S. S. Its anastomosis with cavernous receptacula and circular sinus.

T. The opening of the superior petrous into the cavernous.

V. V. *Receptacula*, or *cavernous sinuses*; on the side of the sella equina.

X. X. The *transverse sinus of the sella equina*.

Y. Y. The *circular sinus* of Ridley.

Z. Z. Anterior veins of the cerebrum.

a. a. The principal artery of the dura mater.

b. b. The veins which accompany it,

d. d. The carotid arteries in the receptaculum.

e. e. The little artery in the receptacle to the nerves of the fifth pair.

f. f. Ophthalmic arteries, the origin from the carotid.

g. g. The posterior angulated clenoid processes.

b. Crista galli. i. i. Frontal sinuses.

k. k. Nerves of the fifth pair.

l. The third branch. m. The second branch.

n. The first branch, f. Ophthalmicus.

o. Nerve of the fourth pair.

p. Nervous trunk of the third pair.

q. The division of the fifth pair from the sixth.

r. Nerve of the sixth pair.

s. Origin of the intercostal nerve.

t. t. The entrance of the *seventh* pair into the dura mater.

u. u. The first roots of the *eighth* pair.

x. x. *Second* root of the *eighth* pair. y. y. *Ninth* nerve.

z. Foramen of the medulla spinalis.

In the right eye: after the lacunar of the orbit and a great part of the os male is destroyed.

1. 1. Ophthalmic artery.

2. 2. An exterior or lachrymal ramus of the same, accompanying the nerve.

3. 3. Interior surculus extending to the nose.

4. 4. Branches which go to the sclerotica, some to the uvea.

5. 5. The reliquæ of the muscles of the palpebræ and eye.

6. End of the levator palpebræ.

7. Lachrymal gland. 8. Optic nerve.

10, 21, 22, 23, 24, 25, 26, 27, 28, 29. As in the other eye.

In the left eye.

9. Trochlea. 10. Pathetic muscle.

11. Levator muscle of the eye.

12. Internal muscle of the eye.

13. Abductor resectus.

14. A branch of the third pair to the levatores oculi and palpebra.

15. Reliquus truncus.

16. The outermost branch to the obliquus inferior.

17. The middle branch to the rectus inferior.

18. The innermost branch to the rectus inferior.

19. A branch to the ophthalmic ganglion.

20. A branch of the first ramus, the superior branch of the five pair.

21. Exterior surculus of the same, 22 interior.

23. Exterior branch of the first ramus of the fifth pair.

24. Ramuli going to the face through the foramina maxillæ.

25. Ramula to the lachrymal gland.

26. Inferior branch of the first ramus of the fifth pair.

27. A surculus of the same to the ganglion.

28. A ramulus to the nostrils.

29. Trunculus creeping anteriorly.

30. Ophthalmic ganglion.

31. Ciliar nervuli.

31, 7 & 8. As in the right eye,

PLATE XXV. *Basis of the brain.*

AA. anterior view of the basis of the cerebrum, with the posterior lobe a little reclined, to shew the *fissura Sylvii* and the cerebrum somewhat drawn back to exhibit the lowest seat of the ventricle.

A A. *The posterior lobes of the cerebrum.*

B B. *Anterior lobes of the cerebrum.*

C C. *Fossa Sylvii*: which ascends to the bivium of the anterior ventricle.

D D. *Cerebellum.*

E. *Commencement of the spinal marrow.*

F F. *Corpora pyramidalia*, at the beginning of the medulla oblongata are four eminent bodies of which the interior and tunid collicles diminished backwards in a point are called *corpora pyramidalia*.

G G. *Corpora olivaria*; are two exterior, short, medullary, obtuse collicles, or *eminences*, mixed with cineritious stria, called *corpora olivaria* from their figure, which may be easily displaced from their seat.

H H. *Pons Varolii*: not only inscribed with transverse, but also with furrows decussating in different ways, which the arteries seem to cause; it is a convex body in the superior surface of the medulla oblongata; as the crura of the cerebelli subject themselves to the crura, they then become, as it were, an arch, placed over two streams meeting together which is called *pons*, and attributed to Varolius; others call it the annular protuberance.

Part of the *plexus choroidei*: in the anterior ventricles, plexuses of vessels occur, as it were, twisted into a rope by means of a membrane, which is the propago of the pia mater, and are called *plexus choroidei*: the figure is triangular, plane, and expanded, like a veil painted with many small arteries. But other more compound plexuses are continued, in part, convoluted, slender, the *right* and *left*, and lastly, they are joined together. The pia mater convoluted spreads in the inferior part of both horns of the lateral ventricle. In that seat of the plexus of the cranium propullates into the basis of the cerebrum, free, placed on the arising optic nerve, and covered by the pia mater alone, is continued to the anterior and posterior end of the thalamum, and the terminations of the *septem lucidum*.

I I. *Mammillary eminences*, or *eminentie quadrigenae*.

K K. Part of the *crura cerebri*: the crura cerebri are two medullary eminences which arise from the basis of the cerebrum, and terminate in the pons Varolii.

L L. *The optic nerves* before they unite.

M. *Their conjunction.*

N N. *The optic nerves* separated.

O. Part of the pia mater subject to the third ventricle.

P. The seat of the *infundibulum*.

Q Q. Anterior part of the *corpus callosum*: upon cutting away the falk from the *crista galli*, and drawing down the hemisphere, a longitudinal white, convex portion presents itself called *corpus callosum*.

Z. Part of the anterior perpendicular lobe of the cerebrum.

R R. *Olfactory nerves*; arise from the *corpora striata*, and they pass through the cribrose foramina of the ethmoid bone into the cavity of the nos, and are distributed in numerous branches in the pituitary membrane, for the purpose of smelling.

S S. Nerves of the *third pair*, *motorum oculorum*: is divided into six branches; 1. to the levator muscle of the palpebra; 2. to the superbus; 3. humilis; 4. bibatorius; 5. to the oblique inferior; 6. to the tunics of the eye, goes out from the lowest crura cerebri and migrate to the orbit of the eye.

T T. Nerves of the *fourth pair*, or *sympathetic* nerves; they are the smallest.

V V. Nerves of the *fifth pair* *divisum*; this pair is the largest of all; divides into 1. ophthalmic; 2. superior maxillary; 3. inferior maxillary, afterwards into the *infra orbitale, temporal, palatine, nasal, pterygoid, dental, lingual, auricular* branches, &c.

X X. Nerves of the *sixth pair*; the *par adducens*.

Y Y. *Hard* and *soft nerves*, or the *seventh* acoustic pair, is composed of two nerves whose nature is different; the *soft* to the organ of hearing; the *hard* makes to the *facial* branches; the second the *auricular*.

Z Z. Nerves of the *eighth*, or *par vagum*.

a a. Nerves of the *ninth*, or *lingual* par.

b b. Anterior roots of the *first cervical* nerve: *tenth*, or *cervical* par, found out by Willis, and properly called the *first* nerve of the *neck*, has two roots, anterior and posterior, run into a ganglion, and form an arch with the adjoining second nerve of the cervix, is supplied a branch to the intercostal nerve, and beneath the occiput goes out of the medulla spinali.

c c. *Vertebral* arteries.

d. *Right inferior* arteries of the *cerebelli*.

e. A branch to the inferior surface of the cerebellum.

f f. *Antic spinal* arteries.

g. Their first arch.

h. *Left inferior* arteries of the *cerebellum*.

i i. Branches of the basillary to the pons Varolii.

k k. Branches of the same to the cerebellum.

l. A branch of the accompanying auditory nerve.

m. A branch of the *fifth* pair.

n n. *Superior* arteries of the *cerebellum*.

o. *Cervical*, or *basillary* artery.

p p. *Deep* arteries of the *cerebrum* arising from the cervical.

q. A branch thence to the plexus choroidicus.

r r. Branches to the mammillary eminences and fundus of the third ventricle.

s s. *Communicating* arteries, or *circle of Willis*.

t t. Trunks of the *internal carotids*.

u u. Their *anterior* branches.

v. Their anastomosis and a branch going out to the third ventricle.

w w. *Posterior* Branches of the *carotids*.

x. A branch from thence to the plexus choroidicus.

PLATE XXVI. *Plexus of the cerebrum.*

The greatest portion of the anterior and posterior part of the *cerebrum*, or brain, removed to the posterior end of the *tricorn* ventricle, to shew the uncovered and perfect *velum* injected, &c.

AA A. *Medulla cerebri*; of which more hereafter.

B. Part of the *cerebellum*; in general the lobes of the *cerebellum* are two, alike and equal, which a *falx* from the *dura* membrane divides in two shallow parts. Some divide the lobes that are somewhat deeper than a furrow into three lobules.

C. *Vermis*.

D. *Corpus callosum*.

E E. Arteries of the *corpus callosum*.

F. Middle part of the anterior *cerebrum* confusedly expressed between the *corpora striata*.

G G. *Corpora striata*; obscurely drawn, are two long cineritious eminences, elevated in the basis of the anterior ventricle: they were so called from the external appearance exhibiting many longitudinal roundish white streaks; they are composed externally of a cortical, and internally of the medullary substance of the brain; together united they concur to the formation of the *crura* of the *cerebrum*.

H H. *Thalamus of the optic nerves*.

I I. The double *semicircular centre*, or *limbus* of the striated body of *Willis*: white streaks produced from the *anterior commissure*, and frequently from the *crura* of the *fornix*, but especially from the *medulla* itself, before the *thalami* of the brain. The anterior end is various, and is continued with one gross fibre of the *fornix* of the anterior *crus*; the other part before that *crus*, subjected to the *corpus callosum* of the *cerebrum*, vanishes: another, lastly, in the posterior face of the larger *commissura* imitating a nerve.

K K. The *posterior crura* of the *fornix* reflected.

Lower than the *corpus callosum* and forwarder, more short and gracile, the rest parallel, the other a medullary arch, which is called *fornix*.

The middle base of it is simple, as of the *corpus callosum*, it lies upon the interior convex *jugum*; yet as a curtain from the *pia mater* it intercedes the medullary collicles, which are called the *thalami opticorum nervorum*: these are two posterior protuberances of the ventricles of the *cerebrum*, white and terminating in the optic nerves.

The anterior and posterior terminate in two *crura*.

The anterior go behind the anterior *commissura* of the *cerebrum*, under the *thalami* of the optic nerves.

The posterior *crura* immit themselves in the *hippocampus*, but not always.

L L. *Plexus choroides*; within the anterior and lower part of each of the ventricles begins the vascular plexus, called *choroides*, included in the *pia mater* only, it lying naked in the rest of the cavity of the skull, formed of a great number of small arteries, together with little veins, originating from a larger trunk; all which vessels, joined together by the *pia mater*, resemble a curtain variously folded. From this plexus, probably, proceeds the internal warmth of the brain, with its exhalation and absorption. The choroidat plexuses become very broad, where the anterior ventricles of the brain begin to defend; and thence, contracting gradually downward, they project their extremities to the ends of the anterior ventricles, covered only with the *pia mater*.

M. Some glands in the *dura mater* of the *tentorium* first discovered by *Haller*.

NNN. Origin of the *velum*, or *plexus*, interposed to the *choroides* from the *pia mater* of the posterior lobe of the *cerebrum*.

O. The anterior end of that *velum* in the choroid plexuses.

P. *Glandula pinealis*; obscurely appearing, subjected to this middle plexus. It is a small conoid eminence of a cineritious colour, lying on the quadrigemine eminences: joined with basis of the *medulla* of the *cerebrum*.

Behind the third ventricle and superior of the *cerebrum* are four eminences, called *nates* and *testes*, the pineal gland is lying on these covered upwards with a great series of vessels, which are a continuation of the choroid plexus.

Q. The great veins of *Galen*, the right trunk: *Galen* not only hath seen the vein, but the division of it, and he calls it a *great vein*, the division of which fills the *conarium*, the declivity also about the *conarium* he observed.

R. The trunk of it is always present.

S S. Branches of the superior artery of the *cerebellum* spread through that viscous.

T. *Surculus* of its artery thrown between the plexus of the *choroides*.

V. The other *surculus*, or *spring*.

X X. Arteries from the profound or deep cerebral to the same plexus.

Y Y. Anterior branches of the same plexus, they go out in the *corpora striata*, lightly expressed in this figure of the cornu of the posterior ventricle, of uncertain length, short and sometimes longer they are found; which seems to arise from the foot of the *hippocampus*; yet as a *fossa* separated from the foot of the *hippocampus*. This oval tubercle is used to be, as with one end bent inwardly.

PLATE XXVII. *Arteries of the brain.*

Upon removing the middle plexus, and cutting through the great part of the nudated thalamus and cerebrum, the cerebellum becomes conspicuous. The weight of the parts containing the anterior ventricle makes them fall down on each side, and discovers the ventricle very beautifully.

A A. *Cerebrum*: its medulla appears yellow from the blood of the dissected arteriolæ, but when these guttelæ are wiped off it appears white.

The figure of the brain is almost an oval.

Superiorly it is divided into two hemispheres by the falciform process.

Inferiorly, from the basis of the cranium into six lobes. The external or cortical substance is greyish; the internal and medullary is white.

B B. *Cerebellum*. The processes from the cerebellum to the medulla spinalis are four; in general similar and equally converging medullary columns tend downwards from the crura of the cerebellum into the beginning of the medulla spinalis, and touch one another with their utmost extremities.

Externally they are moderately conspicuous from the medulla, unless at its end, which swelling in the form of a club, resembles some of the corpora olivaria.

On the internal side of these processes, some but obscure tumors sometimes appear, subrubellous and of a cortical nature.

C. Part of the corpus callosum; transverse striæ in the corpus callosum are easily discovered more evident posteriorly, but also lines of the same kind appear in its interior medulla. The corpus callosum is an oblong medullary prominence, which is conspicuous by turning back the anterior and middle hemispheres of the brain.

D D. *Corpora striata* externally cineritious. The *corpora striata* are two protuberances of a greyish colour anteriorly, under each fore ventricle one is placed.

E E. The double semicircular centre, or *tænia semicircularis*.

F F. *Thalami nervorum opticorum*, are two posterior protuberances of the ventricles of the brain, whitish, and finishing in the optic nerves: they extend to the superior ventricles of the brain, and to the third ventricle.

G G. Their superior surface exteriorly is partly white, partly cineritious. Their convexity tends towards the third ventricle and receive the fornix, then in a direct line, as if reflected, they touch together, and frequently coalesce.

H H. *Linea alba*; it begins in the posterior commissure, and is inserted into the double semicircular centre.

I. *Posterior commissure of the cerebrum*.

K K. Anterior crura of the fornix cut.

L. *Anterior commissure of the brain*: this medullous, robust, fibrous funis, stretched beyond the anterior termination of the ventricle, which unites the right medulla of the cerebrum with the left before the thalami opticorum nervorum, and before

the anterior crura fornix. It runs into that white fibrous commissure, which runs through the thalami and geminum centrum; and crura of the fornix, and gives some white filaments.

M. *Testes*: in the four *quadragesima* eminences, are four collicles, or eminences, the inferior, less, and more flat pair is called *testes*, of which the exterior f. c. is white; they are sphericles divided.

N. *Nates*: the more superior pair of the collicles, nearer to the conario, called *nates* by the ancients; a vesum is placed on these collicles.

The *corpora quadragesima*, therefore, are four eminences, or prominences, the anterior are called *nates*, the posterior *testes*.

O. *Glandula pinealis*.

P. *Linea transversa alba* fourth ventricle.

Q. Part of the medulla oblongata, which is the side of the fourth ventricle.

R. *Calamus scriptorius*.

S. *Linea alba*, from which the nervus mollis arises.

T. *Fourth plexus choroideus*.

V V. Part of the crura of the cerebrum. The crura of the cerebrum are two medullary columns, which proceed from the basis of the cerebrum, or brain, and are terminated in the *pons Varolii*.

X X. Process from the cerebellum to the nates.

Y Y. *Arteria profunda* of the cerebrum arising from the vertebral.

Z Z. Branches to the posterior processes of the cerebellum reflected.

a. First external branch, thence to the plexus medius and thalami.

β. Second branch to the testes and that plexus.

c c. Third branch to that plexus.

d. A branch of the *arteria superior* of the cerebellum going to the nates and testes.

e. The left fourth nerve with a simple radix.

f. Right fourth nerve arising from a double root.

g g. Branches from the superior artery of the cerebellum to that vices.

b. Propago, or a shoot of the superior artery of the cerebellum deeper than the left.

i. Artery of the nates and testes from the superior part of the cerebellum.

k k. Branch from it to the fourth ventricle.

l. A large branch to the nates testes, pineal gland, and fourth ventricle.

m. Another branch of it to the nates and testes.

n. Anastomosis of the branch *a* & *l*.

x. Branch from the profound trunk of the *arteria cerebelli* to the nates and testes.

a a. Right trunk of an artery of the same.

b b. Another branch to the nates and testes.

o o. Arteriolæ to the plexus choroideus, arising from the inferior artery of the cerebellum.

p. Arteries arising from the anterior carotids to the profunda of the cerebrum before the anterior commissure.

q. And ascending behind that commissure.

r. *Arbuseula vitæ*.

PLATE XXVIII. *Of the medulla spinalis, or medullary spine.*

Figure I. the *cerebellum* of an infant cut perpendicularly into two parts, the *fourth ventricle* and *medulla spinalis*, beheld on its posterior side, together with its nerves.

- a. *Pineal gland.*
- b b. *Corpora quadrigemina.*
- c c. The *fourth pair* of nerves of the cerebrum.
- d d d d. The *cerebellum* cut through perpendicularly to shew the *fourth ventricle*.

e e e e e e. The two appearances of a perpendicular section of the *cerebellum*, in which the medullary substance on either side appears dispersed into rami, which is called *arbor vitæ*.

From this arbor the medullary substance, as it were collected from branches into a trunk, ascends, as is evident, to the *corpora quadrigemina*, and is called *vatula magna cerebri*, seu *pedunculus cerebri superior*.

But a part of the *medulla cerebelli*, particularly extends to the *pons Varolii* and inferior pedunculi, or *posterior corpora pyramidalia* of the *medulla oblongata*, which, nevertheless, cannot be shewn in this view.

f f. *Fourth ventricle*, which is nothing else than a kind of furrow imprinted on the posterior face of the posterior *corpora pyramidalia* of the *medulla oblongata*.

These two bodies are separate from one another in the fourth ventricle by a perpendicular sulcus, to whose sides they descend *perpendiculars eminentiæ duæ*, from which others laterally proceed outwardly, and at length bending to the sides of the *corpora pyramidalia*, run anteriorly to the origin of the portion nerve, called *mollis acusticus*.

Above these last eminences white medullary, as it were, fibres usually run, from which, with propriety, some anatomists deduce the origin of the soft portion of the auditory nerves, at least pro parte.

But these lines are not always present, from which it is doubted whether they are at all essential to the soft nerve.

h h. *Eighth pair* of nerves of the cerebrum, with the accessory nerves, and the recurrent from the *medulla spinalis*.

i. *Ligamentum pia matrix.*

k. *Appendix* of the *medulla spinalis* intercepted with the *cauda equina*.

The posterior appearance of the *medulla spinalis* with thirty pair of spinal nerves are evident of themselves.

And it is also evident, that every *spinal nerve* arises from one double anterior root, and another posterior, of which every one is composed of

many nervous funiculi, and that those roots continually increase in length from the first pair of cervicals, until they are the longest of the last sacral.

Also *ganglia* of single spinal nerves are perceptible, into which neither anterior or posterior root run, but the posterior only passes the ganglion, but the anterior is found annexed ei infalutato through the celluloso only.

The sizes of the spinal ganglion are evident also; the least are in the first pair of cervicles, thence they gradually increase to the last cervical and first dorsal, again through the back they diminish in size, and in the lumbar they increase to the first sacral, until the last sacral becomes equally small as the first cervical.

The roots of the sacral nerves are placed without the natural situation to shew them better.

Figure II. represents one of the sacral nerves with its ganglion, ut clare ob oculos ponatur, quænam ejus radix ganglion transeat.

- a. *Posterior radix* of one of the sacral nerves.
- b. *Ganglion*, through which the first radix only of the nerve passes.
- c. *Anterior radix* evidently separated from the ganglion utpote quæ sola tantum cellulositate illi adhæserat.

Figure III. is the *fourth ventricle*, with the principium of the *medulla spinalis*.

a b. a b. Posterior appearance of the *posterior corpora pyramidalia*, when the fourth ventricle is taken out.

c c. *Perpendicular sulcus*, which separates the two former bodies in the fourth ventricle.

d d. *Perpendicular eminences* near the sulcus.

e c. ————— *transverse*, more or less observable, they extend to the origin of the portion of the soft acustic nerve.

f f. *Medullary white striæ*, which also extend to the soft portion, but not always, and are sometimes wanting.

g g. Here the Illuf. Haller indicates the posterior *corpora olivaria*, but nothing like them is to be found.

h h. *Eighth pair* of cerebral nerves.

i i. *Recurrent spinal and accessory nerves* to the eighth pair.

k k. *Anterior roots* of the first pair of cervicals.

l l. *Posterior roots* of which communicate with the left recurrent spinal.

m m. *Posterior radices* of the second pair.

n n. *Posterior radix* of the third pair of cervicals which do not consist of ramous, or branched, but of cylindrical nervous cords.

o o. *Vertebral arteries* perforating the *dura mater*, which invests the *medulla spinalis*.

P L A T E XXIX.

Figure I.

Is a portion of the right nerve of the third pair of the cerebrum.

- a b.* Part of this nerve, which yet runs down in the cavity of the cranium, and has its involucrum from the pia mater only.

In this part are observed interrupted striæ sufficiently deep, penetrating into the medullary substance of this nerve, which are formed from the *septa* of the pia mater, sent down into that substance, and those vascular.

Similar *striæ*, originating from the same cause, are seen in the optic nerves; before entering into the orbits they acquire *involucra*, or covering, from the dura mater.

- b c.* Here more strongly finding an involucrum, it goes into thicker and concatenated funicles.

- d.* Is a cord from a branch of the ophthalmic nerve running to the third ramus of the third pair of the cerebrum.

Figure II.

That portion of the nerves of the fifth pair of the cerebrum, which is principally contained in the cavity of the cranium, taken away, and the dura mater nudated is seen on the superior part.

- a.* Trunk of the fifth pair of nerves of the cerebrum, consisting of many nervous cords of unequal thickness, and uncertain number, so that 70, 90, and even 100, have been discovered.

These cords are multiplied to infinity, and concatenated together, which concatenation, the most scientific anatomists have not remarked, but have only represented their parallel and united course.

- b b.* Semilunar ganglion of Gasser, which derived its name from the discoverer.

- c.* First branch of the fifth pair, or the ophthalmic deprived of its cellular involucrum.

- d.* Second branch of the same, or superior maxillary.

- e.* Third branch, or maxillary inferior. Upon taking away the cellulose involucrum of these three rami, it is evident that each is composed of many *funiculi* frequently concatenated together.

Figure III.

Is a nerve of the fifth pair of the cerebrum of the same side, beheld on its inferior part.

- a a.* Trunk of the fifth pair.

- b b.* Its semilunar ganglion.

- c.* First, or ophthalmic ramus.

- d.* Second branch, or superior maxillary.

- e.* Third ramus, or maxillary inferior, which gives off three evident rami, of which

- f.* 1st, Sends off the pterygoid, masseteric, temporal, buccinatory branches, &c.

- g.* Second inferior maxillary, or alveolaris, properly speaking.

- h.* Third lingual.

These two last, at their commencement, are covered with much cellulose substance, so as to appear to form one trunk.

- i.* Is a peculiar fasciculus of nervous funiculi under the trunk of the fifth pair, which arising from almost a common origin with the fifth pair under the semilunar ganglion in a peculiar impression, runs into that ganglion.

- k.* Portion of the sixth pair of the cerebrum running through the sinus cavernosus, consisting of one cord, after its origin or insertion of the great intercostal nerve becoming somewhat thicker, and having two short striæ impressed on it.

- l.* Origin of the great intercostal nerve, or rather, as it were, double posterior and anterior insertion into the nerve of the sixth pair, consisting of many and very thin funicles, which suddenly run together, and are again dissolved.

Figure IV.

A view of another nerve of the fifth pair of the right, viewed on the inferior side, together with the neighbouring portion of the nerve of the sixth pair.

- a.* Trunk of the nerve of the fifth pair.

- b b.* Semilunar ganglion, through which, towards the inferior maxillary branch, many funiculi irresolved pass.

- c.* First branch.

- d.* Second branch.

- e.* Third branch.

- f.* Peculiar fasciculus of nervous funicles under the semilunar ganglion, going towards the inferior maxilla.

- g.* Portion of the sixth pair of the cerebrum.

- h.* Another origin of the great intercostal nerve, or sympatheticus magnus of Winslow, different from the former, but which is frequently observed. This other nexus of the 6th pair of nerves, with the ophthalmic, is not found by Haller and many others; unless cellular and vascular; but not at all by any nervous funicles, neither from the ophthalmic to the great intercostal, any nervous root is cut off, and unless a subtle injection of the vessels with coloured liquor penetrate, the observer is easily mistaken.

P L A T E XXX.

Figure I.

This represents the brachial plexus of the right side of a grown-up man, together with the ganglions of the fifth, sixth, seventh, and eighth pair of cervicals, and first of the dorsal nerves, from which the brachial plexus is composed.

Every plexus of this nerve was carefully excorticated of its first cellulous involucre, to shew the *funiculi* of the nerves alone and naked, and their different thickness and manner of communication.

5.6.7.8. Nerves of the four last pair of cervicals.

1. Nerve of the first pair of dorsals.

aaaaa. *Funiculi*, which are made of the anterior roots of these nerves arising from the medulla spinalis, and they pass the ganglions of the posterior roots, nor do they unite to the posterior roots unless afterwards these go forth out of their ganglions.

bbbbbb. *Funiculi*, from the posterior roots.

cccc. Ganglia formed from the posterior roots.

dddddd. Trunks of nerves running together to form the brachial plexus: of which the first, *i. e.* five cervicals, consists of one gross funiculus only; but the others frequently communicate together.

These trunks afterwards are implicated in a surprising manner, which are better understood by a figure than an operose description.

e. *Nervus supra scapularis*.

f. *Axillary, or circumflexal nerve*.

g. *External cutaneous, or musculo cutaneous nerve*.

h. *Radial nerve*.

i. *Median nerve* with double root; viz.

k. l. Going out of the brachial plexus.

m. *Cubital nerve*.

n. *Internal cutaneous nerve*.

ooo. Are other lesser nerves coming out of the brachial plexus indiscriminately, and without any names.

Figure II.

Is a portion of the *median nerve*, of which funiculi being disjuncted, by the removal of the external *cellular vagina*; yet the mutual inosculation are exhibited.

They are all delineated in their natural size, yet it was necessary to prolong some funiculi, and especially those which connect the others transversely, in the delineation, to exhibit them clearly at one sight, yet some of the funiculi were obliged to be cut.

aaaa. Are tubercles, to which many others may be seen, which arise from the medulla of the nervous funiculi, there propelling the *vagina*, which has less resistance.

Figure III.

Are portions of the nerve of the ninth and tenth pair of the cerebrum.

Both were cut away near their exit from the cranium, and are of the right side.

a. Nerve of the eighth pair, here consisting of many funiculi, of which one goes to form

b. The *nervus pharyngeus*.

c. Here the *nervus vagus* swells, and consists of fewer funiculi.

d. *Nervus laryngeus*, arising from the vagus, and cut off and reclined posteriorly.

ee. Portion of the *nervus vagus* descending through the neck, conspicuous after its cellulous involucre, or coat, is taken off, so that the nervous funiculi may be seen in it, which are joined together in a multiplied concatenation.

gg. Nerve of the ninth pair, or *lingual* of the cerebrum, consisting of one only gross funicle, yet ramous, at the time it enters the tongue. This nerve coheres with the vagus, as well through the cellulose, as small nervous funiculi, which are apparently cut.

h. Nerve from the ninth pair, called the *descendens*, cut off, having many roots from the ninth pair, of which some are the beginning of the *lingual nerve*, &c.

Figure IV.

Is a similar portion of the tenth nerve and ninth pair of the cerebrum from the right side, but taken from another subject, which is here given for the sake of variety.

a. *Nervus vagus*, consisting of three funiculi.

b. *Nervus pharyngeus*, from which one funiculus descends, and below unites with the trunk of the eighth pair.

c. *Nervus laryngeus*.

d. Here the *nervus vagus* consists of one funiculus only, and that large and unequally round.

e. A portion of the *nervus vagus* descending through the neck.

fff. Nerve of the ninth pair of the cerebrum, or *lingual*, making one funicle only, ramous towards the tongue.

g. The nerve called *descendens*, from the ninth pair of the cerebrum, of which the superior extremity cut away, was united with the *nervus vagus*.

If we attentively consider the nature of the nexus, we shall easily be persuaded, that this nerve ought to be called, not less *ascendens*, than *descendens*.

P L A T E XXXI.

Figure I. represents a particle of the optic nerve running in the orbit to the bulb of the eye, beheld through the lens, with the diameter of the objects increased 400 times.

a a a a. External vagina of the optic nerve produced from the internal lamina of the dura mater.

b b b b. Interior substance of the nerve, consisting of many funiculi.

c c. Two arteriolæ, which disseminate nervous funiculi above and below.

Figure II. is a transverse section of the optic nerve, in which sections of the nervous funiculi appear distinct, like *mole hills*.

Figure III. is a transverse section of the ischiadic nerve of a grown-up man, which was first dried to cut from it the thin lamella, which was afterwards again moistened in water, so as nearly to attain its lateral magnitude.

The natural size is here somewhat increased, the better to express the thinner funiculi of nerves.

a a a a. Cellular tela constituting the external vagina of the nerve.

b b b b. There are only four transverse sections of funiculi composing the ischiadic nerve *expressed*, the others are evident of themselves, and in what respect they differ in size and figure.

Figure IV. is a particle of a lamella of the ischiadic nerve cut transversely, delineated through the lens, increasing the object 100 times in diameter.

a a a a. Cellular vagina surrounding and running between the nervous funiculi.

Figure V. Transverse section of a nervous funiculus, beheld through the lens, augmenting the diameter of the object 400 times.

The whole section appears to be composed of very little globules unequally divided.

Figure VI. In a lamella of the ischiadic nerve cut transversely, which, suspended in water, was examined by means of the lens, augmenting the diameter of the object 400 times, one nervous funiculus hath had a pendulous situation, which the figure represents.

a a a a. Part of the funiculus, as yet surrounded with its own vagina.

b b. Medulla of the funiculus expressed by the elasticity of the vagina, beheld laterally.

Figure VII. is a particle of the pulpæ medullæ spinalis suspended in water.

Consists merely of very little globules promiscuously, as it seems, leaning on each other, and

connected together through the most subtle cellulose texture, by even macerating in water, scarcely to be dissolved.

Figure VIII. IX. X. XI. represent three medullary globules of greater magnitude, varying their figure and size according as the lens by which they are examined is either placed nearer or more remote from the object.

Figure XII. represents a portion of the ischiadic nerve of an infant injected through the arteries.

The size is moderately increased to represent the arteriolæ better.

a. Trunk of the ischiadic nerve, in which the funiculi are clearly seen.

b. External popliteal nerve.

c. Internal popliteal nerve.

b. d. c. d. Here the tela cellulosa, more copious, covers the nerves, and more vessels were filled.

e e e e. Arteriolæ from the neighbouring cellulose substance running to the nerve, and there creeping into nervous funiculi.

a. Figure XIII. is a portion of a gross funiculus of the cervical nerve running to form the brachial plexus.

b. A fungus, or monticulus, projections of a medullary substance, divided into irregular *areolæ* by deep streaks.

These striæ demonstrate how the membranous *sepia* arises from the internal superficies of the exterior involucre of the nervous funicles.

Figure XIV. represents the præternatural fungosity of the medullary substance of the nervous funiculi, which arose from an amputation of the arm of a woman, whose hand and fore-arm was badly gangrened, or mortified. The woman lived a long time after the operation; at last, when she died of another disease, it gave an opportunity of examining the truncated member, in which were observed in all the extremities of the affected nerves, that their extremities had swelled into nodes, from which the radialis nerve being more accurately examined, after the cellular structure was removed, it demonstrated how from the funicles of the same nerve the medullary substance grew out, as of an unformed white mole, and sufficiently hard.

a a. Nervous funiculi here forming the radial nerve connected together by a wonderful concatenation.

b. Fungosity, or excrescence of the medullary substance of the funiculi of the radial nerve.

P L A T E XXXII.

Intercostal, cervical nerve, or the sympathetic magnus.

The great importance of an accurate conception of these nerves, their connections and distributions to various parts, must be obvious. Symptoms arising from sympathy of parts in various diseases are clearly demonstrated, and many affections, formerly obscure, traced to their true and original causes, not by imaginary vain hypotheses, which have so much injured and degraded the art of physic; but by demonstrative facts, that can be reiterated by every industrious anatomist and physiologist. On these subjects much may be seen in my treatises on nervous diseases, &c.

Name and origin.

Great sympathetic nerve; from the sixth pair of nerves of the brain.

a. *First, or great cervical ganglion*; between the processes of the first and second vertebrae, and angle of the maxilla inferior.

b. *Ramus mollis*; is of reddish, soft nature.

c. *Ramus cardiacus supremus, vel superficialis*.

d. *Truncus intercostalis cervicalis*; from the superior to the inferior ganglion.

e. *Inferior cervical ganglion*; to the fifth vertebra of the neck.

f. *First internal branch*.

g. *Second Ramus*.

h. *Ramus superficialis*.

i. *Ramus profundus*.

k. *Ganglion dorsale primum; magnum, seu thoracicum superius*; to the first vertebra of the back.

l. *Ganglion parvum, vel secundum*; between the first and second rib.

m. *Ganglion dorsale tertium*; between the second and third rib.

n. *Par vagum*; eighth.

o. *Nervus recurrens*; of the par vagum; above the subclavian artery.

p. *Nervus accessorius Willisii*; or superior recurrent nerve.

q. *Anterior ramus, or branch of the first pair of cervical nerves*.

r. ————— of the second pair.

s. ————— trunk of the third pair.

t. ————— fourth pair.

u. ————— fifth pair.

v. ————— sixth pair.

w. ————— seventh pair.

x. ————— eighth pair.

y. *First pair of dorsal nerves*.

Divisions.

Has three ganglions, branches, filaments, and many *furculi*, or sprigs.

Receives ramuli from the first, second, and third nerve of the cervix, sometimes from the eighth and ninth pair of the cerebrum.

Two Ramuli.

Unus tertius.

Receives a branch from the intercostal cervical nerve, and many anastomoses.

Communicates with the second branch of the fourth pair.

Receives branches from the fifth and sixth pair of cervicals.

Anastomoses with the supreme and recurrent cardiac.

Communicates with recurrent of the eighth pair.

} Are inserted into the first dorsal ganglion above the subclavian artery.

Communicates with the sixth pair, eighth and first dorsal.

Is as it were an appendix of the great thoracic ganglion; receives a branch from the first dorsal nerve.

Receives a ramulus from the second dorsal nerve.

Its trunk.

Has many ramifications and anastomoses.

Perforates the sterno and cleidomastoid muscles.

Unites with the second pair.

Communicates with the former.

Has many anastomoses with the fourth pair.

Communicates with the third pair.

} The fifth and sixth pair are joined together.

Communicates with the sixth pair.

} Are joined together, and send off ramuli.

Distributions.

Distributed through the neck, thorax, abdomen, &c.

Sends out the ramus mollis, cardiacus supreme, and inferior trunk.

Run up to the internal carotid.

Covers the external carotid, and goes to the larynx and pharynx.

Runs to the larynx, musculus sterno thyroideus and gland, and aorta.

A ramification goes to the thyroid gland; the trunk runs to the inferior ganglion.

Sends off branches the first, second, superficial, and profound.

To the cardiac plexus.

Runs to the trachea, pulmonary artery, vena cava.

} Form the ansæ, or laquei Vieussenii.

Sends off an anonymous trunk, rami to the cardiac plexus, aorta, pulmonary, and coronary arteries.

Trunk runs to the third ganglion.

As the above.

Descends in the neck.

To the larynx, trachea, arteria pulmonaris, aorta.

Descends to the musculus cucullaris.

Sends out a small branch to the great cervical ganglion.

Gives two small ramifications to the ganglion.

Forms the phrenic nerve, and runs to the sterno cleidothyroid muscle.

Gives phrenic, diaphragmatic, profound, and medial nerves.

} Hence the scapula and phrenic nerve, and pectoral muscle.

To the serratus anticus, &c.

} To the pectoral serrated muscles; form the cutaneous, internal, and median nerve.

P L A T E XXXIII.

De nervo sympathico magno, or, Of the great sympathetic nerve.

Represents the nerves in the right side of the body running to the heart, and their *plexus*, between the *aorta*, *arteria pulmonalis*, et *aspera arteria*, (quatenus inprimis a nervis dextris conficitur.) The proper and relative situation of many nerves is changed, otherwise they would not be clearly exhibited, or in any way delineated. Thus, the *subclavian* artery is cut off; the *common*, *external*, and *internal carotid*, with other sanguiferous vessels; also may be seen the *aorta* drawn on the left side. The appearance of the head, with the *larynx*, *pharynx*, *aspera arteria*, and *æsofagus*: which being deprived of the posterior cellular structure, by which the adjacent parts adhere, by so much they secede from the bodies of the left vertebræ. But the *par vagum*, with the *recurrent nerve*, and other nerves coming forth from that, as likewise the *vena cava superior* of the right side are removed.

A. Part of the right external ear.

B. *Mammillary* process covered by the *sterno* and *cleido-mastoid* muscles.

C. D. *Sterno* and *cleido-mastoid* muscle: C. their insertion into the *os occipitis* and *temporal bones*; D. separated from the *sternum* and *clavicula*, and reclined upwards and posteriorly.

E. The *splenic* muscle of the head, by which it is inserted into the *os occipitis*.

F. *Musculus biventer cervicis*, and especially its extremity inserted into the *os occipitis*: the whole cucullaris muscle is taken away.

G H I. *Musculus biventer maxilla inferioris*: G. its first venter: H. *Tendo medius*: and I. second venter inserted in the *maxilla inferior*.

K. *Musculus stylohyoideus*, annexed to the basis of the *hyoid* bone, which in this body was found divided into two plain portions, between which two bellies the tendon was seated.

L. *Glandula maxillaris*; which in part covers the *biventer* muscle of the *maxilla inferior*, or rather is marked with a longitudinal sulcus in which this muscle is situated.

M. *Glandula parotis*.

NN. Part of the *maxilla inferior* denuded.

OOO. An incision of the common integuments.

PP. *Musculus stylopharyngeus*, in part conspicuous.

Q. *Superior constrictor* muscle of the *pharynx*.

R. *Middle constrictor*.

S S. *Inferior constrictor*.

T. *Musculus sternohyoideus*.

V V. ——— *sternohyoideus*.

W. Another venter of the *coracoid* muscle (inserted in the inferior and anterior part of the basis of the *hyoid* bone, with a part of the middle tendon.

X. *Musculus hyothyroideus*.

Y Y. The right and left *mylohyoid* muscles inserted in the base of the *hyoid* bone.

Z. *Musculus ceratoglossus*, arising from a horn of the *os hyoidis*.

Γ. Part of the *thyroid* gland.

Δ Δ. *Æsofagus*.

Θ Θ. *Aspera arteria*; dividing on the lower part into two branches, which are usually called *bronchia*.

Δ. Ε. ΙΙ. Σ. Φ. Ψ. Bodies of the *vertebræ* of the neck; Δ. of the second; Ε. third; ΙΙ. fourth; Σ. fifth; Φ. sixth; Ψ. seventh for the head.

Ω. a. b. Bodies of the *dorsal vertebræ*: Ω. of the first; a. of the second; b. three from the neck. The bodies of the *vertebræ* of the neck and back, upon removing the sanguiferous vessels, and reclining the *pharynx* and *larynx* on the right, here come in sight.

c. The muscular *longus* of the neck by chance represented.

d. ——— *rectus capitis internus major*.

e e. ——— *scalenus prior*, divided into three caudæ.

f f. ——— *scalenus medius*.

g g. ——— *lateralis*, with its superior cauda running to the *transverse* process of the third *vertebræ*; in this body it is thicker than usual.

h. *Musculus levator scapulæ*.

i. *Arteria axillaris*.

k. *Arteria thoracica externa* f. *secunda*.

l m n. l m n. Three superior ribs; l l. first; m m. second; n n. third.

o o. *External intercostal* muscles.

p p. *Internal*.

q q. r r. s. *Right lung*: q q. its convex f. *external* surface; r r. *internal* plane surface, running towards the *mediastinum* reclined on the right hand; s. an incisure dividing the superior and middle lobe.

t t. Convex f. *external* surface of the *left lung*. The whole of this lung appears compressed from the arch of the *aorta* being drawn on the left.

u. v. Two carnosous parts of the *diaphragm*, f. *superiore*: u. right; v. left; conspicuous on its superior f. convex surface.

w w w. x. *Pericardium* in part left; w w w. its lateral parts; x. inferior part connected with the tendinous centre of the *diaphragm*.

y. *Vena cava superior*, moved out of its situation on the right, whence the *vena azygos* appears a little retracted.

z. *Vena cava inferior*: f. *ascendens*, which expand to constitute the right sinus.

a. *Vena azygos*.

It would be an useless repetition to pursue the different parts of this plate farther; whoever wishes to proceed to a minute investigation of the nervous system, which is principally intended for *physicians* only, will easily comprehend the whole by referring to the Latin references.

P L A T E XXXIV.

FIGURA I.

Also delineates the nerves running to the heart from the right side of the human body, and the branches laying over the arteria aorta. Thus, this is represented with the *subclavian*, *common*, and *internal carotid* arteries, in as natural a situation as could be preserved: the more considerable nerves running behind these vessels are only marked by points. The whole neck, for the same reason, is extended as in the first plate, viz. by putting under it a wooden cylinder. But of those parts which the preceding plate represents, the following are cut away: *external ear*, *sterno*, and *cleido-mastoideus* musculus, *biventer maxillæ inferior*, *stylohyoideus* with the *mylohyoideus* muscle, and also the *maxillary* gland and *processus stylohyoideus*.

A. Musculus *biventer cervicis*, whose tendinous extremity, affixed to the *os occipitis* with a certain part of the flesh is perceived.

B. Musculus *splenius capitis*, and its tendinous extremity, inserted in the *occipital* bone, *maxillary* bone, and *processus cognomini*.

C. Musculus *levator scapulæ*.

D. ————— *scalenus lateralis*.

E E E. ————— *medius*.

F. ————— *prior*.

G. ————— *rectus capitis internus major*.

H. ————— *styloglossus*.

I. ————— *stylopharyngeus*.

K. ————— *constrictor pharyngis medius*.

L. ————— *inferior*.

M. ————— *hyothyroides*.

N. Superior venter of the musculus *coracohyoideus*.

O. Musculus *sternohyoideus*.

P. ————— *sternothyroides*.

Q. ————— *ceratoglossus*, proceeding from the *cornu* of the *hyoid* bone to the tongue.

R. ————— *basiloglossus*, arising, some part of it from the horn of the *os hyoidis*, but the greater part from its basis.

S. ————— *geniohyoideus*.

T. ————— *genioglossus*.

V. ————— *longus colli*, visible in part.

W. Part of the *superior constrictor* muscle of the *pharynx*.

X. Musculus *sterno-mastoideus* of the left side.

Y. Occipital bone.

Δ. Mammillary process of the *temporal* bone.

Θ. *Meatus auditorius externus*, as yet covered with skin on its interior surface. At the same time a particle of the cartilage adheres to it.

A. *Styloid* process is removed with a part of the *temporal* bone, from which it was taken.

E. *Capitulum maxillæ inferioris*, s. *processus condyloideus*. The ligament covering it is dissected.

Π. Angle of the *maxilla* inferior.

Ξ. *Sublingual* gland, in a part prominent.

Φ. Basis of the *hyoid* bone.

Υ. A situation where the *cornu* of the *hyoid* bone lies concealed.

Ω. *Thyroid* cartilage.

a. Common trunk of the *carotid* arteries.

b. Its *cerebral* ramus, called *internal carotid*.

c. Its flexure, called *flexure Cowperiana*, always present extra the canal of the *carotid*; in the body it verges so much out as to cover, in a part, the *internal jugular vein*.

d. *External* ramus of the *carotid*, called *externa carotis*.

But it must be observed, that the common *carotid* artery Lit. a. *internal* Lit. b. and *external* Lit. c. in this figure are removed a little forward. For in its natural situation the *carotis communis* and *interna* lay near to that very long ganglion, Num. 168, 169, 170, even somewhat cover it.

g. Common trunk of the *lingual* and *labial* artery.

h. *Lingual* artery, running under the musculus *ceratoglossus*.

i. *Labial* artery of *Haller*, the rami of which are omitted; it is called by others *angularis* s. *facialis*.

k. Trunk of the *external carotid* artery rising towards the temples.

l. Occipital artery, which ascends obliquely above the *internal jugular vein*.

m. The artery *auricularis posterior* is cut off in this body more remarkable than usual.

n. Artery running to the *masseter* muscle.

o. ————— *parotid* gland.

p. ————— *maxillaris interna*.

q. ————— *temporalis*.

r. ————— *subclavia*.

s. ————— *axillaris*.

t. ————— *cervicalis profunda*.

u. ————— *thyroidea inferior*.

v. *Transverse scapular* ramus of the *thyroid* artery.

w. Arteria *vertebralis*.

x. ————— *mammaria interna*.

z. *laryngea* (otherwise, it usually proceeds from the *superior thyroid*.)

FIGURE II.

A delineation of the *great cervical ganglion*, the arteries being removed, &c.

a. Exterior ramus of the *intercostal* nerve.

b. Ramus interior.

d e f. Part of the *superior cervical ganglion*, &c.

FIGURE III.

A. B. C. &c. See the Latin edition,

13. The *superior cervical ganglion*.

15. The *inferior cervical ganglion*.

All the minute investigations may be easily pursued in the Latin references, &c.

P L A T E XXXV.

FIGURE I.

The body being placed in the same position as in the explication of Plate XXXIII. the whole of the *auris externa*, with the *cartilagineous meatus auditorius*, also the *mastoid* and *styliforme* processes, with the annexed muscles, and some other parts, are removed, the better to shew the conformation of the superior nerves.

- a. The bony *meatus auditorius*.
- b. Radix of the *mastoid* process cut off.
- c. *Condylloid* process of the *inferior maxilla*.
- d. *Angle of the inferior maxilla*.
- e. Transverse process of the first vertebra f. *atlas*.
- f. Inferior lateral part of the body of the *atlas*, process of the oblique descendens, which a little predominates.
- g. Musc. *rectus lateralis of the head*.
- h. Superior part of the musc. *levator scapulae*.
- i. Part of the musc. *obliq. inferior*.
- k k. Musculus *scalenus prior*.
- l. First rib to which the muscle just mentioned is annexed.
- m m. Musc. *rectus internus major of the head*.
- n. ——— *longus of the neck*.
- o. Arteria *innominata*.
- p. ——— *subclavia dextra*.
- q. ——— *thyroidea inferior*.
- r. Transverse *scapularis* ramus of the same.
- s. Arteria *vertebralis*.
- t. ——— *cervicalis profunda*.
- u u. Common trunk of the *carotids*.
1. Superior radices of the *intercostal* nerve running into one nerve in the *canalis caroticus*, which here enters from the canal already mentioned.
2. Ramus from the first pair of *cervical* nerves inserted in this nerve.
3. Another ramulus running from the anterior ramus of the first pair of *cervicals* to this nerve.
4. 5. Ganglion *cervicale superius*, consisting of two tubera and a thinner intermediate portion in this case.
6. Ramus *gangliiformis*, stretching out from the third pair of *cervicals* to the first *cervical* ganglion, and forming as it were the cauda, or tail, of the ganglion.
7. Ramulus which descends from the preceding ramus to the fourth pair, or *vice versa*, it ascends from the fourth.
8. 9. Two ramuli running from the conjunction of the anterior ramus of the first pair with the anterior ramus of the second pair to the superior ganglion.
10. Ramulus dilabens, from the anterior ramus of the second pair to the ganglion already mentioned.
11. Ramus from the *par vagum*, inserted in that ganglion.
12. First ramus *mollis*, running from the ganglion.
13. Superior ramulus of the same, which uniting with a ramulus of the nervous *glossopharyngeus*, Num. 35.
13. Goes to the *constrictor medius of the pharynx* and *stylopharyngeus*.
14. Inferior ramulus of nerve Num. 12, inserted in the *constrictor medius of the pharynx*.
15. Second *mollis* nervous of the superior *cervical* ganglion.
16. Surculus of this running to the third nervous *mollis*.

17. Conjunction of ramus, Num. 15, with surculus Num. 33, of the nervous *glossopharyngeus*.
18. Surculus of the second nervous *mollis*, Num. 15, to be united with a surculus of the nervous *laryngeus*.
19. Another surculus of ramus Num. 15, which is implanted in the *inferior constrictor* muscle of the *pharynx*.
20. Third and more remarkable nervous *mollis* of the superior ganglion.
21. First ramulus of the same, which gives
22. A surculus to the *lingual* artery, and
23. Another surculus running to the ramus Num. 39 of the nervous *laryngeus*.
24. 24. Ramulus from the third nerv. *mollis*, Num. 20, which descends behind the trunk of the *carotids*, then curving round the same appears in the exterior surface, *vid.* Num. 246.
25. In this part the third nerv. *mollis* is inflected around the inferior part of the *thyroid* artery exteriorly.
26. Ramulus accompanying the *thyroid* artery.
27. Ramulus of the third nervous *mollis*, Num. 20, ascending exteriorly above the *external carotis*.
28. Its ramulus, saluting the *labial* artery.
29. Ramulus which ascends further to the *internal* and *temporal maxillary* artery.
30. First ramus of the *par vagum*, called the *glossopharyngeus*, drawn a little upwards from the other nerves.
31. Insertion of the *portio dura* of ramulus Num. 47 in this nerve.
32. Ramulus of the *glossopharyngeus*, descending to the nervi *mollis*.
33. Posterior surculus of the same acceding near the second nervous *mollis*.
34. Anterior surculus going to the ramulus of the nervous *laryngeus*, Num. 39.
35. Another ramulus of the nervous *glossopharyngeus*, to be united with a surculus of the first nervous *mollis*, Num. 13.
36. 37. The remaining part of the nervous *glossopharyngeus* exhibiting two *lingual* nerves.
38. Nervus *laryngeus* of the eighth pair.
39. Ramulus of the same running to the nervi *mollis*.
40. Anterior surculus of it, which uniting with ramus Num. 18 of the second nervi *mollis*, goes to the *constrictor inferius of the pharynx*.
41. Posterior surculus of the same, which sends off
42. 43. 44. Three surculi departing to the *constrictor inferius of the pharynx*.

FIGURE II.

Represents principally the nervous *mollis* from another subject.

Figure III.

Is taken from an infant eight days old.

FIGURE IV.

The body of an adult in the same manner as figure of this plate, &c.

P L A T E XXXVI.

Of the nerves of the thorax and abdomen.

FIGURE I.

This figure represents not only the intercostal nerve from the sixth rib to the third vertebra of the os sacrum in the right side, but also the sixth inferior costal, lumbal, and sacral nerves. The os ilii, ischium, and pubis, are removed, that their parts situated in the cavity of the pelvis, and the nerves migrating to them, may be conspicuous.

6. 7. 8. 9. 10. 11. 12. Six inferior ribs, of which each is marked by its number.
 VI. VII. VIII. IX. X. XI. XII. Six inferior dorsal vertebrae.
 I. II. III. IV. V. Spurious vertebrae of the os sacrum.
 I. First spurious vertebra of the os sacrum.
 A. Lateral part of the first spurious and second vertebra of the os sacrum cut with a saw almost to the foramen from which the first and second sacral nerve go out.
 B. Cartilage of the os pubis of the left side S.
 C. Transverse process of the first vertebra of the loins.
 D. Transverse process of the second lumbar vertebra.
 E. Transverse process of the third lumbar vertebra.
 F. Transverse process of the fourth lumbar vertebra.
 G. Transverse process of the fifth lumbar vertebra.
 a. Inferior lobe of the right lung.
 b b b. The remaining portion of the pleura, forming the posterior mediastinum.
 c c c. Ductus thoracicus pulled a little from its natural situation between the vena azygos and aorta.
 d d. Pericardium including the heart.
 f. Inferior vena cava, entering the cavity of the thorax, through the right four-sided foramen of the diaphragm.
 g g g. Diaphragm separated from the ribs.
 h. External crus of the diaphragm.
 i. Middle crus of the diaphragm.
 k. Internal crus of the diaphragm.
 l l. Right kidney so removed from its natural situation as to be drawn upwards and towards the left side.
 m m m. Ureter.
 n n n. Vesica urinaria.
 o o o. Intestinum rectum.

- Δ Δ. Inferior portion of the intestinum colon, which terminates its flexure of the same, called Romana.
 p p. Levator intestini recti.
 * * Musc. spinofo-dexter and spinofo-coccygeus.
 q q. Ligamentum spinofo-sacrum.
 r r. Uterus drawn up and to the left.
 s s s. Vagina.
 t t t. Ligamentum rotundum of the uterus.
 v v v. Tube Fallopii.
 w. Ovarium.
 x x. Corpus cavernosum of the clitoris with the levator muscle of the clitoris adhering to it.
 H H H H. Skin of the nates and perinæum.
 I I. Skin covering the internal surface of the femora and the external pudenda.
 K. Skin of the mons veneris.
 L L. Labia pudendorum majora.
 M M M. Vena cava placed without its natural situation, viz. upwards and on the left.
 N. The right iliac vein cut off.
 O. Left iliac vein.
 P. Common trunk of the right renal vein Q. and of the right spermatic vein R.
 S S S S. Aorta.
 T T T T T. Arteriae intercostales aorticæ; the last of these runs under the eleventh rib.
 V V V V V. Lumbal arteries. Six in this body are lumbal arteries arising from the aorta, but the last is omitted.
 X X. Arteria renalis.
 α α. Internal superior spermatic artery between two renal arteries, viz. right and left, arising from the aorta.
 β β. Arteria spermatica, interna, inferior.
 Y. Right iliac artery.
 Z. Right crural artery.

FIGURE II.

This shews the narrow vinculum of the great sympathetic nerve of the right side, with the sympathetic of the left side, and the true termination of both. The same figures are retained, &c. as in the first.

In this elegant, well-executed plate, the lateral view of all the parts of the pelvis and loins, &c. are accurately exhibited. The situation of the urine bladder, uterus, and rectum, their appendages, the kidney, part of the lungs, diaphragm, &c. with vessels, nerves, and their ganglions, plexuses and ramifications, connections, &c. become grand objects for the contemplation of all those industrious students, who wish to lay a solid foundation for acquiring profound knowledge: the more they study, the more they will be delighted with the wonderful structure of the nerves, and they will not, after proper application, say with the ignorant, that physicians know nothing of the nervous system. What application in the practice of physic may be made of these pursuits, may be seen in my treatises on nervous diseases, &c.

P L A T E XXXVII.

Explains the origin and nature of the ganglion called semilunar; or rather of the cœliac ganglions of the right side; exhibits the renal and spermatic ganglion of the right side, and anastomosis of the same with the ganglia of the left side, the origin of the superior mesenteric plexus and the inferior mesenteric plexus, and right hypogastric nerves.

A A A A. Inferior facies of the right lobe of the hepar reclined.

B. Vena cava.

C C. Rami of the vena cava entering the hepar.

D D. Part of the costal diaphragm.

E E E. Right ala of the diaphragm.

F F. Part of the lumbar diaphragm.

G. External crus of the diaphragm.

H. Middle crus of the diaphragm.

I. Internal crus of the diaphragm.

K K. Right phrenic artery.

L L. Right ramus of the right phrenic artery.

M M. Left ramus of the right phrenic artery.

N. Common trunk of the superior left coronary artery of the ventricle, and of the left hepatic artery.

O. Right hepatic artery.

P. Lienal artery.

Q. Superior mesenteric artery.

R R. Right renal artery cut off.

α. Artery of the succenturiate ren arising from the right renal artery.

S S. Aorta.

I. First vertebra of the loins.

II. Second.

III. Third.

IV. Fourth.

V. Fifth.

I. First spurious vertebra of the os sacrum.

a. Lateral part of the first and second spurious vertebræ of the os sacrum almost to the foramina, from which the first and second sacral ramus go out, sawed off.

b. Right superior spermatic artery.

c. Right inferior.

π. Left spermatic artery.

T. Trunk of the inferior mesenteric artery.

V V V. Lumbar arteries, answering to their vertebræ.

X. Ramus ascendens of the infer. mesent. artery.

Y. Ramus descendens of the same.

d d d d d. Rami of the descend. infer. mesent. artery, rami migrating to the intestinum colon.

Z Z. Right iliac artery.

f. Left.

g. Left hypogastric artery.

h. Left crural artery.

i. Right hypogastric artery.

k. Right crural artery.

m m m. Portion of the intestinum colon forming the flexure Romana, so called.

29. Anterior ramus of the fifth pair of lumbar nerves.

62. Trunk of the symp. nerve, or nerv. anast. of the ganglion, with the 11th thoracic ganglion.

63. First radix.

64. Second rad. which *arises* from the anterior ramus of nerve 24. Plate XXXVI. Fig. I. and run into the first lumbar ganglion.

65. Third rad. terminated in the trunk of the nerv. symp. or into nerv. anastomosis between the first and second lumbar ganglion.

69. Exterior surculus of nerve 66. Plate XXXVI. Fig. I. inserted into the great symp. nerve, or nerv. anastom. between the first and second lumbar ganglion.

70. Trunk of the nerv. symp. magn. or nerv. anastom. between the first 61. and second ganglion 78. Plate XXXVI. Fig. I.

78. Second lumbar ganglion.

79. First radix sent by the anterior ramus of the first pair of lumbar nerves, Plate XXV. Fig. I. to the second lumbar ganglion.

80. Second radix which the second lumbar ganglion receives from the anterior ramus of the first pair of lumbar nerves.

81. 81. Radix from nervus anastom. between the first lumbar nerve and the ganglion singular of the second lumbar nerve 104. Plate XXXVI. Fig. I. which, at its origin, is bicrural, then simple, and is inosculated in the trunk of the nerv. sym. mag.

97. 97. Surculus nervosus arising from anastomosis between the first lumbar nerve 25. Plate XXXVI. Fig. I. and ganglion singulare 104. Plate XXXVI. Fig. I. of the anterior ram. of the second lumbar nerve 26. Plate XXXVI. Fig. I. which is finished in the ligaments of the vertebræ.

98. Third lumbar ganglion.

P L A T E X X X V I I I .

This Plate represents the great sympathetic nerves and par octavum, or nervus vagus in the left side of the body. The course of the intercostal nerve begins beneath the sixth rib, and its further progress in the first spurious vertebra of the os sacrum is cut off.

1. Seventh rib.
2. Eighth.
3. Ninth.
4. Tenth.
5. Eleventh.
6. Twelfth.
7. Ninth vertebra of the back.
8. Tenth.
9. Eleventh.
10. Twelfth.
11. Second vertebra of the loins.
- III. Third.
- IV. Fourth.
- V. Fifth.
- I. First spurious vertebra of the os sacrum.
- A A A A. Left lung.
- B B B. Pericardium and heart inclosed in it.
- C C C. Oesophagus.
- D. Cardia.
- E E E E. Ventriculus, or stomach.
- F F F. Pancreas.
- G G G. Lien.
- H H H. Left kidney.
- I. Pelvis renalis.
- K. Ureter cut off.
- L L. Left bronchus.
- M M M M. Part of the lumbar diaphragm.
- N. Crus, or left external appendix of the diaphragm.
- O. Crus, or internal appendix of the diaphragm.
- P P. &c. The musc. psoas major cut at the end, to shew the exits of the lumbar nerves, and the origin of the lumbar ganglia, the better.
- Δ Δ Δ. Musculus psoas minor.
- Q Q Q. Aorta.
- R. Left subclavian artery.
- S. Left carotid artery.
- T T. Ductus arteriosus of Botalli.
- V. Left superior bronchial artery.
- X. Arteria œsophagea, from which runs
- Y. The left inferior bronchial artery, which is cut off.
- Z Z. Left bronchial artery cut off at its origin from artery Y. running down to the left bronchus.

- a. a. Anastomosis between the left superior and left inferior bronchial artery.
- b b b. Left pulmonary artery.
- c c. Sac of the pulmonary veins.
- d d d d. Pulmonary veins.
- f. Trunk of the cœliac artery.
- g g. Left phrenic artery.
- h. Truncus communis of the left hepatic artery, and of the left superior coronary of the ventricle.
- k. Left hepatic artery.
- l. Right hepatic artery.
- m m m. Arteria lienalis.
- n n. Arteriæ pancreaticæ.
- o o o. Arteria gastro-epiploica, or left inferior coronary artery.
- p p. Pancreatic arteries, which arteria o o o. spargit.
- q q q q. &c. Rami lienales.
- r r r r. Arteria breves of the stomach.
- s. Trunk of the superior mesenteric artery.
- v v v. Left renal artery.
- π. Left spermatic artery.
- x. Inferior mesenteric artery.
- y. Right iliac artery.
- z. Left iliac artery.
11. Fourth aortic intercostal artery.
12. Fifth.
13. Sixth.
14. Seventh.
15. Eighth.
16. Ninth.
17. Third lumbar artery.
18. Fourth.
19. Fifth.
20. Sixth left intercostal nerve.
21. Seventh.
22. Eighth.
23. Ninth.
33. Tenth.
34. Eleventh.
35. Twelfth.
36. First left lumbar nerve.
37. Second.
38. Third.
39. Fourth.
40. Fifth.
41. Sixth left thoracic ganglion of the great sympathetic nerve, or nervus intercostalis.

P L A T E XXXIX.

Plate XXXIX. represents the nerves of the liver and stomach composed by the conflux of the right and left cœliac ganglion, which could not be so well expressed in Plate XXXVI. XXXVII. and XXXVIII.

A A A. Inferior surface of the right lobe of the liver.

B B B. Inferior surface of the left lobe of the liver, drawn upwards and a little back.

C C C. Lobus quadratus of the liver.

D. Posterior lobe, or *Spigelius hepatis*.

E E. Vesica fellea, or gall-bladder.

F. Ductus cysticus, or cystic duct.

G. Ductus hepaticus, or hepatic duct.

H. Ductus choledocus.

I I. Ligamentum sic dictum rotundum hepatis.

K K. Ligamentum latum hepatis.

L L. Pancreas.

M M. Ventricle, or stomach.

N N. Fundus ventriculi, or fundus of the stomach.

O. Pylorus.

P. Cardia.

Q Q. Intestinum duodenum.

R R R R. Portion of the omentum majus.

S S. Portion of the omentum minus.

T T T. Part of the lumbar diaphragm.

V. Left superior orifice of the diaphragm, or sphincter of the œsophagus.

X. Vena cava.

Y Y. Trunk of the vena portarum.

Z. Right hepatic artery, which almost always arises from the aorta with the common trunk with the left hepatic artery.

a a a. Arteria cystica.

b b. Right superior coronary artery.

c c c. Right inferior coronary artery, or arteria gastro-epiploica dextra.

d. Trunk of the left arteria gastro-epiploica cut off.

f. Truncus communis of the left hepatic and left superior coronary artery.

g g. Left hepatic artery.

h h. Cardiac artery, arising from the left hepatic.

i. Ramus stomachicus, which the left hepatic artery emits.

k. Arter. coronar. sinistr. superior.

l l l. Rami of the left coronary artery which tend to the posterior planum of the ventricle.

m m m n. Evanescent rami in the anterior facies of the ventricle.

o o. Arteria lienalis.

p. Arteria pancreatica.

q. Arteria omentalis.

247. Fourth and left cœliac ganglion.

248. Fifth left cœliac ganglion.

249. Sixth.

250. Seventh.

252. Ninth.

253. Tenth.

26. Third radix of the gang. phrenico hepatici. Plate XXXVII. Plate XXXVIII.

δ. Trunculus communis 24 and 25 of the radices of the gangl. phrenic. hepaticum. Plate XXXVII. Plate XXXVIII.

27. Gangl. phrenic. hepatic. which

β. γ. Secedes into two furculi. Plate XXXVII. Plate XXXVIII.

30. 30. Ramus arising from rad. 24, which afterwards sends

31. A furculus to the nervous plexus comprehending the truncus communis of the coronary and left hepatic artery like a net, and joins itself with nerve 28, Plate XXXVIII, into

260. 260. One ramus, which is divided into two rami, viz. the left suprarenal and right hepatic ramus.

261. 261. 261. Ramus suprarenalis running to the left before the cardia, so that at length it is terminated in the left suprarenal gland. Plate XXXVIII.

262. 263. 264. Second right hepatic ramus carried to the left side of the liver with the left hepatic artery.

32. Second principal ramus of the gangl. phrenic. hepatic. Plate XXXVII.

The nerves of the liver are best divided into the right and left; but the nerves of the stomach are not so, for this receives its principal nerves in the left side from the left cœliac nerve and the eighth pair.

PLATE XL. *Of the thorax and abdomen.**Name and situation.**Structure, connection, &c.**Use.*

1. The *larynx*, is a cartilaginous capsa situated behind the tongue.
 2. The *internal jugular vein*, is a branch of the superior vena cava.
 3. The *subclavian vein*, situated under the clavicles.
 4. The *vena cava descendens*, is divided into superior and inferior.
 5. The *right, or anterior auricle of the heart*, a muscular sac, opening into the right ventricle.
 6. The *right ventricle of the heart*, is the anterior cavity of the heart.
 7. A portion of the *left ventricle*, in the posterior part of the heart.
 8. The *aorta descendens*, makes an arch from the right ventricle of the heart, towards the vertebræ of the back, descends into the abdomen, and is divided into the iliaes.
 9. The *pulmonary artery*, from the right ventricle of the heart is divided into the right and left branch.
 10. The *right lobe of the lungs*, a portion of it off, to shew the larger vessels; the right is the larger, and is divided into three lesser lobes, and these again into innumerable ones.
 11. The *left lobe of the lungs*, is divided into two lobes.
 12. The *diaphragm*, is a transverse septum below the lungs, its superior surface is covered by the pleura, its inferior by the peritoneum.
 13. The *liver*, is a great viscus in the right hypochondrium, and somewhat in the epigastric region.
 14. The *ligamentum rotundum*.
 15. The *gall-bladder*, oblong, pyriform, in the inferior part of the liver.
 16. The *ventricle, or stomach*, is pressed by the liver to the left side. Is a large cavity between the liver and spleen.
 17. The *small intestines* in the middle of the abdomen, they are: the duodenum, jejunum, ileum; all which are connected and regulated by the mesentery: the large intestines are the cæcum, colon, and rectum.
 18. The *spleen*.
- It consists of five cartilages and various muscles.
- The internal jugular veins begin from the foramina lacerata of the cranium.
- They terminate in the superior vena cava.
- Receives the subclavian, external and internal jugular veins, and the vena azygos.
- The structure is membranous, there are two valves, called mitral valves, annexed to it.
- The heart is divided into right and left ventricle by a carneous substance, called the *septum*.
- This ventricle is stronger than the right.
- The arch of the aorta gives off:
1. The arteria innominata.
 2. The left carotid.
 3. The left subclavian.
- Is distributed into innumerable branches and ramuli of a net-like figure into the pulmonary vesicles.
- The lungs are connected with the sternum and vertebra by means of the mediastinum, with the heart by the pulmonary vessels, with the arteria aspera.
- The substance consists merely of small vesicles and various vessels.
- Its substance is carnosus, muscular, tendinous; it is connected with the sternum, spurious ribs, pericardium, mediastinum, liver, and lumbar vertebræ.
- The substance is vascular; the interior membrane of the liver, which invests the whole substance, is from the peritoneum.
- Becomes tendinous in the adult.
- Consists of *tunics, common, vascular, muscular, and nervous*.
- Is connected with the œsophagus, omentum, spleen, the left orifice, called cardia, is annexed to the diaphragm; the right *pylorus* to the duodenum.
1. The duodenum is twelve fingers long.
 2. The jejunum fifteen spans, situated in the umbilical region.
 3. The ileum twenty spans long, in the hypogastric region.
- Is the organ of speech, and serves for respiration.
- They receive the blood from the sinuses of the cerebrum, cerebellum, &c.
- Convey the blood into the vena cava ascendens.
- Sends the blood into the left ventricle of the heart:
- By this auricle the blood enters the right ventricle of the heart.
- The right ventricle receives the blood carried through the vena cava, and sends it into the lungs.
- From it the blood is driven through the aorta and arteries all over the body.
1. Gives off the subclavian and right carotid.
 2. From thence the external and internal carotids.
 3. The subclavian gives off the submaxillary.
- This artery carries the blood through the whole substance of the lungs, to conqassate and prepare it.
1. Respiration, by which the blood is conqassated, and altered.
 2. Serves for the voice.
 3. The sense of smelling.
 4. Expels the phlogistic particles of blood.
- Its use is similar to that of the right lobe.
- It sustains the lungs, and is essential to respiration; it also excites motion and pressure on the intestines.
- The liver separates the bile. The hepatic duct unites with the cystic duct, and becomes the ductus choledochus.
- Sustains the liver in its situation.
- Collects the bile into the duodenum, through the cystic duct.
- The stomach receives, retains, digests, prepares the food, and dilutes it with the gastric juice, and sends it through the duodenum to the intestines.
- The aliments are mixed in the duodenum with the bile and pancreatic juice.
2. This is mostly empty on account of the vivid action of the lacteals:
 3. Contains an infinite number of lacteals, absorbs the chyle, and sends it off to the glands.

PLATE XLI. *On the abdomen.*

<i>Name and Situation.</i>	<i>Structure, connection, &c.</i>	<i>Use.</i>
1. <i>Pars inferior hepatis</i> ; inferior part of the liver: covers the duodenum, pancreas, &c.	Its <i>superior superficies</i> is convex; <i>inferior</i> concave.	Receives the blood of the <i>vena portarum</i> , and separates the bile from it.
2. <i>Ligamentum rotundum.</i>	Connects the liver to the umbilicus.	Strengthens the liver in the adult.
3. <i>Vesicula bilis</i> , or gall-bladder.	On the under side of the liver.	Receives the bile.
4. <i>Pancreas</i> is a great plane gland, behind the stomach, extending from the duodenum towards the lien, or spleen.	<i>Substance</i> is glandulous. It is connected with the duodenum, mesentery, splenic vessels, and spleen.	Separates the pancreatic juice which serves to attenuate the chyle, being similar to saliva.
5. <i>Lien</i> , spleen, is a viscus in the left hypochondrium, near the bottom of the stomach, covered by the ribs.	<i>Substance</i> : cellulous, vascular. <i>Connexion</i> with the stomach, pancreas, diaphragm, and left kidney.	It receives much blood, as is evident by its vessels; authors as yet are not agreed on its use.
6. <i>Renēs</i> , kidneys; behind the sac of the peritoneum, in the lumbar vertebrae.	<i>Substance</i> is firm and hard. 1. Exterior, <i>cortical</i> . 2. Interior, <i>tubulous</i>	To secrete the urine in the pelvis for depurating the blood, and to convey it by the ureters to the vesica, or bladder.
7. <i>Aorta descendens.</i> From the arch to the diaphragm it gives the following rami.	1. Bronchial; 2. œsophageal; 3. eight inferior intercostal; 4. four diaphragmatic arteries.	1. They run to the <i>vesiculæ pulmonales</i> ; 2. to the œsophagus; 3. to the eight ribs to the sternum; 4. to the diaphragm.
In the abdomen and below it gives.	1. <i>Cœliac artery</i> ; 2. <i>mesenterica superior</i> ; 3. <i>renal</i> ; 4. <i>spermatic</i> ; 5. <i>mesaraica inferior</i> ; 6. <i>lumbares</i> ; 7. <i>sacral</i> ; 8. <i>iliac</i> . The rami go to	1. To the stomach, liver, spleen; 2. <i>Intestinum jejunum</i> , cœcum, colon; 3. kidneys; 4. testicles; 5. colon <i>intestinum rectum</i> ; 6. lumbar & abdomen; 7. near the os sacrum; 8. to the crura.
3. <i>Vena cava ascendens</i> , vel <i>inferior</i> ; the rami, or branches, are:	1. Hepatic; 2. renal; 3. right spermatic; 4. lumbar; 5. sacral; 6. iliac veins.	Receive all the blood returning from the abdomen and inferior extremities.
9. <i>Vena emulgens</i> ; right and left; are inserted into the trunk of the <i>vena cava</i> .	They are divided near the kidneys into two, three, four, or five rami.	They return the blood from the kidneys to the <i>vena cava</i> .
10. The <i>stylus</i> below the <i>spermatic vessels</i> and <i>inferior mesenteric artery</i> , and above the <i>ureters</i> .	The <i>spermatic arteries</i> arise from the aorta; the right vein is emptied into the <i>vena cava</i> .	They carry the blood to the testes. The left vein flows into the <i>emulgent</i> .
11. <i>Ureters</i> ; two canals which terminate in the <i>vesica urinaria</i> .	<i>Substance</i> is membranaceous. The size of a pen.	They carry the secreted urine to the <i>vesica urinaria</i> , or bladder.
12. <i>Vasa iliaca</i> ; iliac vessels; arise from the <i>aorta descendens</i> ; about the last vertebra of the loins are divided into two rami.	1. Internal, commonly called <i>hypogastrica arteria</i> and <i>hæmorrhoidalis externa</i> . 2. External, whence <i>epigastric</i> ; 2. <i>puenda</i> ; 3. external and internal <i>cruralis</i> .	They proceed towards the bladder, rectum, parts of generation, nates, &c. 1. goes through the <i>musculus rectus</i> to the <i>mammæ</i> ; 2. to the <i>puenda</i> ; 3. to the crura and feet.
13. <i>Intestinum rectum</i> ; begins from the colon to the lowest vertebra of the loins; and terminates in ano.	The <i>intestinum rectum</i> is annexed to the os sacrum, coccyx, and bladder in men; but in women, to the <i>vagina uteri</i> .	The rectum is surrounded with much fat, that in the excretion of the <i>fæces</i> it may be easily dilated.
14. <i>Vesica urinaria</i> , or urine bladder; situated in the pelvis; the two ureters carry the urine from the kidneys; but the urethra discharges it at proper periods through the penis.	1. It is connected with the os pubis by the peritonæum; 2. with the parts of generation by the urethra, 3. with the umbilicus by the <i>urachus</i> and umbilical arteries; 4. in the males it coheres with the <i>intestinum rectum</i> ; in women, with the <i>vagina uteri</i> .	Destined to collect and expel the urine; 1. by its retaining, and 2. by its muscular expulsive powers, through the urethra; which action is called, voiding of urine.

P L A T E XII.

FIGURE I. *The three tunics of the eye taken away from the one file to show the humors in their natural situation.*

a. The optic nerve. b. The three tunics of the eye reflected. c. The vitreous humour. d. The crystalline lens. e. The retina laying under the vitreous humour. f. The anterior termination of the retina. g. The posterior striated part of the ciliary body. h. Folds of the ciliary processes resembling white rays. i. A place where, from both sides of the lens, white rays appear distant from the lens. k. The pupil conspicuous through the pellucid lens.

FIGURE II. *Arteries of the eye.*

A. The superior palpebra. B. The superior oblique muscle with the trochlea. C. The adducent muscle. D. The depriment muscle. E. The abducent muscle. F. The anterior part of the attollent muscle cut away. G. The lachrymal gland. H. The bulb of the eye. I. The ambit of the cornea. K. The optic nerve. L. The first branch of a nerve of the fifth pair cut off. a. The ophthalmic artery. b. Ramuli of the optic nerve to the dura mater in the foramen opticum. c. Small accessory arteries with the first branch of the fifth pair of nerves arising from the meningeal and inserted into the lachrymal branch. d. The lachrymal branch. e. Ramuli to the abducent muscle. f. Very thin ciliary arteries arising from the lachrymal and ending in the sclerotic. g. The inferior muscular branch. h. A larger branch of it, from which arises the central artery covered by the optic nerve, &c. i. The inferior, inferior ciliary. k. A branch of the adducent and inferior oblique muscle. l. A branch of the depriment muscle. m. The exterior ciliary muscle. n. A thinner branch of it, which is principally dispersed over the surface of the sclerotic. o. Ciliary furculi perforating the sclerotic. p. A furculus to the sclerotic. q. The arterial circle around the passage of the optic nerve through the thick part of the sclerotic. r. A branch to the attollent muscle cut off. s. Ramuli of the optic nerve to the dura mater. t. The supra-orbital branch accompanying the frontal nerve. u. The posterior ethmoid artery. v. A branch of the adducent muscle. y. A branch of the superior oblique muscle. z. The anterior ethmoid artery. 1. A trunk below the trochlea emerging from the orbit, and divided into palpebral and other anterior rami. 2. 2. 2. Ramuli with the recti muscles of the eye, which go off near the cornea into 3. 3. 3. anterior ciliary arteriolas perforating the sclerotic.

FIGURE III. *The long and short ciliary arteries: circle of the iris.*

a. Sclerotic reflected. b. b. Two long ciliary arteriolas. c. c. Two larger rami, into which every long arteriola is divaricated. d. d. d. Ramuli springing out of each.

branch of the bifurcation, and going to the interior circle. e. e. The interior circle. f. This is duplex in some places. g. g. g. The anterior ciliary arteries, inserted into the interior circle: b. b. b. Short ciliary arteries. i. i. i. A mutual anastomosis between them behind the ciliary orbiculus. k. k. Surculi going into the circle of the iris. l. l. The small arteries of the iris. m. m. Arches by which they are joined about the lesser annulus of the iris. n. Surculi going from these arches towards the pupil.

FIGURE IV. *The fabric of the iris and small ciliary nerves.*

a. The optic nerve. b. The sclerotic reflected. c. Other large ciliary nervuli anteriorly divided into branches. d. Other less branches scarcely ramous. e. e. Two large venous vessels obiter expressa. f. A foramen in the sclerotic through which passes the venous vessel. g. The least venous vessel. h. The ciliary orbiculus. i. The great annulus of the iris. k. The parallel serpentine fibres of the iris. l. Larger fibres joined together per arcum, the greater number of which constitute the lesser circle of the iris. m. The interior smaller annulus of the iris. n. Straight fibres from the convexity of the arches going to the pupil. o. The pupil.

FIGURE V. *The small veins of the choroides and iris.*

a. The vagina of the optic nerve cut from the dura mater and reflected. b. The optic nerve. c. The central venula running on the surface of the nerve, and hiding itself near the eye in the substance of the nerve. d. d. d. d. Four reflected angles of the sclerotic. e. e. e. Angles of the cornea. f. f. f. The black circulus which distinguishes the cornea from the sclerotic. g. g. g. Small foramina of the sclerotic near the cornea, for the passage of the anterior ciliary vessels, arteries, and veins. h. Foraminulum majus, for the vorticose vessel. i. i. Two larger vorticose vessels from the other side, divided into many ramuli. k. Ramuli running backwards, some of which meet. l. l. With the posterior ciliary venula perforating the sclerotic near the insertion of the optic nerve. m. Anterior ramuli going to the iris. n. Vas vorticosum minus, less elegant. o. The intermediate accessory venula joined to both the larger vorticose vessels, divided into many ramuli. p. Long ciliary venula. q. The ciliary nervulus, the constant companion of the venula longa. r. Two ramuli, into which the long ciliary venula is divaricated, under the callosity of the ciliary orbiculus. s. s. s. Three anterior ciliary venulae cut off. t. t. Lateral ramuli with which the venulae passing from the choroides into the iris communicate. u. Parallel serpentine venulae of the iris. v. The anterior lamella of the iris reflected. y. The pupil.

PLATE XLIII.

FIGURE I.

Nerves of the bulb and muscles of the eye.

- A. Bulb of the eye.
- B. Lachrymal gland.
- C. Musculus adducens.
- D. Musculus attollens.
- E. Levator palpebræ.
- F. Musculus deprimens.
- G. Musculus adducens.
- H. Obliquus superior.
- I. Trochlea.
- K. Part of the muscle obliquus inferior.
- L. Course of the carotids in receptaculo.
- M. Carotid penetrating into the cavity of the cranium.
- N. Ophthalmic artery arising from the carotid.
- a. Optic nerve penetrating its foramen.
- b. Nerve of the fifth pair in the cavity of the cranium.
- c. Third branch of a nerve of the fifth pair.
- d. Second branch of the same.
- e. First branch.
- f. Frontal branches of the first ramus e. again divided into two branches.
- g. Nasal ramus of the first branch e.
- b. b. Ciliar ramuli of the branch g. running above the nerve.
- i. Lachrymal branch of the branch e.
- k. Nerve of the fifth pair.
- l. Double nerve of the sixth pair in receptaculo.
- m. Double radix of the intercostal nerve from the sixth pair.
- n. Insertion of the sixth pair into the abducent muscle.
- o. Trunk of the nerve of the fifth pair.
- p. Superior minor branch of the third pair.
- q. Ramuli of ramus p. to the attollent muscle.
- r. Ramulus of branch p. to the levator palpebræ.
- s. Inferior major ramus of the third pair.
- t. Branch of ramus s. to the adducent muscle.
- u. Branch of ramus s. to the depriment muscle.
- x. Branch of ramus s. to the obliq. inferior.
- y. Ophthalmic ganglion separated from the optic nerve, and pulled backward to shew the division of the third pair.
- z. Short radix of the ophthalmic ganglion from the nerve of the obliq. inferior.
- 1. Long root of the ganglion from the nasal ramus of the fifth pair.
- 2. Superior fasciculus of the ciliary nerves formed by four nervuli.
- 3. Fasciculus inferior.

- 4. Ramulus of the inferior fasciculus seceding outwardly from the others.
- 5. Ramulus inserted in either surculus b. b. arising from the nasal nerve, ascending to the external side of the optic nerve beneath the superior fasciculus.
- 6. Interior inferior ciliar nerve of the inferior fasciculus.

FIGURE II.

Ophthalmic ganglion with ciliar nerves.

- A. The attollent muscle pulled back a little to shew the inferior part to which the nerve is inserted.
- B. Levator palpebræ.
- C. Carneous portion of the trochleator.
- D. Tendo of the trochleator with trochlea.
- E. Portion of the adducent muscle with a branch of the nerve of the third pair.
- F. Portion of the deprimens with a nervous branch inserted into it.
- G. Internal view of the abducent muscle.
- H. Insertion of the obliquus inferior.
- I. Portion of the superior palpebra.
- a. Optic nerve.
- b. Nerve of the fourth pair cut off.
- c. Nerve of the sixth pair inserted in its muscle.
- d. Nerve of the third pair.
- e. Superior ramus.
- f. f. Surculi of branch e. to the attollent muscle.
- g. A branch of ramus e. to the levator palpebræ.
- b. Inferior branch of a nerve of the third pair.
- i. Branch to the deprimens.
- k. Branch to the adducent *casually expressed*.
- l. Branch to the inferior oblique muscle.
- m. Frontal branch of the fifth pair cut off.
- n. Nasal branch of the same.
- o. o. Two ciliar nervuli arising from the nasal.
- p. Ophthalmic ganglion annexed to the exterior side of the optic nerve.
- q. A long root from the nasal ramus of the fifth pair.
- r. Short radix from the nerve e. of the oblique inferior muscle.
- s. Superior fasciculus of ciliary nervuli composed of three nervuli.
- t. Large inferior fasciculus.
- u. Surculus always bent outwardly, and acceding to the bulb by a long circuitous course.
- x. Interior and inferior ramus of this fasciculi inserted into the branch of either arising from the nasal.

P L A T E XLIV.

FIGURE I.

Membranula of the ciliar corona, by which the crystalline lens is joined with the vitreous, and the Petition canal turgesces, or swells, with flatus.

- a.* Vitreous humour.
- b.* Crystalline lens.
- c.* Serrated annulus conflat, formed from the nigrum pigmentum lying on the anterior part of the vitreous humor and the corona ciliaris.
- d. d.* Bullulæ, into which the membranule of the ciliar corona is elevated upon the admission of flatus.
- e.* Vulnufculum, by which the air is admitted.

FIGURE II. & III.

Artery of the crystalline lens conspicuous on its posterior view, and indeed,

In Fig. 2. Its natural magnitude, and

In Fig. 3. Increased in magnitude by a microscope.

FIGURE IV. V. VI.

Three figures of crystalline lens from men of different ages, and principally,

Fig. 4. From a new-born infant.

Fig. 5. From an infant some years old.

Fig. 6. From a grown-up man about twenty years old, to shew that the lens is always more convex the younger the person.

FIGURE VII.

Crystalline lens beginning to form triangular squamous appearances after maceration in water.

FIGURE VIII.

Sebaceous glands of Meibomius from the posterior view of the palpebræ.

- a.* Tarsus of the superior palpebra.
- b.* Tarsus of the inferior palpebra.
- c.* Internal canthus.
- d. d.* Glandulous plexus, commonly called Meibomian glands.
- e. e.* Orifices of those plexus in the extreme margin of the palpebræ.

FIGURE IX.

- a.* Internal canthus of the eye.
- b.* Inferior palpebra.
- c.* Aponeurosis of the musculus levator palpebræ.
- d.* Meibomian glands conspicuous per aponeurosin.

FIGURE X.

Vie lachrymarum.

- a.* Orifices of Meibomian glands.
- b.* Semilunar membranule before the caruncle lachrymalis.
- c.* Caruncula lachrymalis.
- d. d.* Puncta lachrymalia.
- e. e.* Two canaliculi joined together near the nasal sac.
- f.* Lachrymal sac.

The great utility of these, and other minute anatomical demonstrations of the organ of vision, will appear to those who study the diseases of the eye, many of which disorders would be incomprehensible without such previous knowledge. In the third volume of the *Rational Practice of Physic*, after a short introduction on the doctrine of vision, and the defective modes of treating eye diseases; I have demonstrated, that there are 118 diseases of the eyes, eye-lids, &c. and it is hoped, many important improvements will be found in that work worthy of the serious attention of surgeons, and practitioners of medicine, in general.

P L A T E XLV.

FIGURE I.

Origin of the tunics of the eye; internal appearance of the choroides.

a. Optic nerve cut off. *b.* Exterior lamina of the vagina of the optic nerve. *c.* Interior lamina of the vagina of the optic nerve. *d.* Pia mater of the optic nerve. *e.* Central artery. *f.* Part of the cribriform lamina through which the medullary substance of the optic nerve passes. *g.* The sclerótica posteriorly thick where it is connected with the vagina of the nerve. *h.* A circle surrounding the cribriform lamina whence the pia mater of the optic nerve is reflected, and *i.* goes into the interior lamina of the sclerótica. *k.* Parallel arteries apparent in the internal surface of choroides. *l.* Vascular reticulum obscurely adumbrated; by which the arteries of the choroides are covered. *m.* White folds of the ciliary processes. *n.* Iris. *o.* Connection of the sclerótica with the cornea.

FIGURE II.

Reticulum laid over the choroides only visible by a very magnifying microscope.

a. Arteriolæ of the internal surface of the choroides. *b.* Vascular reticulum. *c.* Natural magnitude of this portion of the choroides, of which this is the resemblance.

FIGURE III.

Annulus of the ciliary processes obscurely seen a little enlarged.

a. Part of the sclerótica. *b.* Part of the choroides. *c.* Ora serrata, which distinguishes the annulus from the remaining choroides. *d.* Posterior part of the serrated annulus. *e.* Anterior part, composed of the folds of the ciliary processes. *f.* Anterior, broad, eminent part of the folds. *g.g.* Some folds terminated, in the extreme, bifid. *h.* Posterior part of the fold formed by many radiculæ. *i.* Posterior view of the iris, called uvea, striated. *k.* Pupilla.

FIGURE IV.

Three folds of the ciliary processes, whose vascular fabric is observable in a good microscope.

a. Innumerable parallel arteriolæ, conspicuous in the

internal surface of the choroides. *b.* Vasculum majusculum, running in the eminent margin. *c.* The arch through which the vascula in the apex of the plica are joined together. *d.* Reticulum vasculosum. *e.* Posterior appearance of the iris. *f.* Natural magnitude of this portion, which is drawn a little increased.

FIGURE V.

A portion of the lesser annulus of the iris seen and delineated by means of a microscope.

a a. The arch which the arteriolæ of the iris form around the lesser annulus designed in the preceding figure, *vid. m m.* *b b.* Ramuli running from those arches towards the pupilla. *c c.* Ramuli running transversely in the annulus minor of the iris and led parallel with the ora pupillæ; which some seem to have taken for orbicular fibres.

FIGURE VI.

Veins of the eye.

A. A portion of the superior palpebra delineated in its passing. *B.* Lachrymal gland. *C.* Abducent muscle. *D.* Posterior part of the attollent muscle cut off. *E.* Anterior part. *F.* Posterior part of the levator palpebræ cut off. *G.* Anterior part. *H.* Superior oblique muscle with the trochlea. *I.* Optic nerve entering the optic foramen. *K.* Nerve of the fourth pair. *L.* First branch of the nerve of the fifth pair. *a.* Trunk of the ophthalmic vein coming out of the receptaculum. *b.* Posterior ethmoid venula. *c.* Ramulus to the optic nerve. *d.* Superior ciliar venula. *e.* Three furculi perforating the sclerótica. *f.* Ramuli per scleroticam ludentes. *g.* Inferior muscular ramus. *h.* Lachrymal branch. *i.* Anastomatic branch between the lachrymal and inferior. *k.* Trunk running above the bulb. *l.* Ramulus to the attollent muscle. *m.* Interior ramus. *n.* Ramus from the trunk inserted. *o.* Into the anastomatic ramus between the trunk and lachrymal. *p.* Interior ciliaris. *q.* Anterior ethmoid. *r.* Trunk going out of the orbit communicating with *s.* the superior palpebræ, and *t.* nasal. *u.* Anterior ciliar venula arising from the muscular ramus, and perforating the sclerótica.

PLATE XLVI. *The muscles of the bulb of the eye.*

FIGURE I.

Muscles with the levator palpebræ superioris.

- a. The bulb of the eye.
- b. The optic nerve in the opuscular cavity.
- c. The optic nerve cut off without the orbit.
- d. Portion of the dura mater, which departs from the optic nerve, and falls into the periostræum of the orbit.
- e. The levator palpebræ superioris, arising from an angle of the division of the dura mater, and terminating in a broad aponeurosis.
- f. The attollens, the greatest part covered by the levator palpebræ.
- g. The obliquus superior inflected through the trochlea.
- h. The insertion of the obliquus inferior.
- i. The depriment muscle.
- k. The abducent arising by a double head.
- l. The lesser superior head.
- m. The inferior head.
- n. The interval between the heads, through which the nerves collected in fasciculum are terminated.
- o. The first branch of a nerve of the fifth pair.
- p. From which first branch the lachrymal branch is cut off.
- q. The frontal branch cut away.
- r. The nasal branch.
- s. A furculus of the nasal branch, which constitutes the long root of the ophthalmic ganglion.
- t. A nerve of the third pair.
- u. A nerve of the sixth pair.

FIGURE II.

The muscles of the eye without the levator palpebræ.

- a. The bulb of the eye.
- b. The optic nerve within the orbit.
- c. The optic nerve without the orbit.
- d. Portion of the dura mater which goes into the periostræum.
- e. The levator palpebræ cut away near its origin.
- f. The superior oblique muscle inflected through the trochlea.
- g. The attollent muscle.
- h. Its tendon dilated near the insertion.
- i. The adducent muscle.
- k. Both the muscles near their rise are so connected with one another, that it should shew the levator palpebræ in its origin not to pertain to the vagina of the optic nerve, but placed on both.
- l. The depriment muscle.
- m. The abducent muscle.
- n. The superior head connected with the attollent.
- o. The inferior head.
- p. The interval between each head.

FIGURE III.

The common tendon, from which the adducent, abducent, and depriment muscles arise.

- a. The optic nerve cut away near its entrance.
- b. The broken osseous septum between the optic foramen and round commencement of the sphenoid fissure.
- c. The dura mater cut away at its entrance into the periostræum of the orbit.
- d. The attollent muscle arising from a division of the dura mater cut away.
- e. The levator palpebræ superioris cut away.
- f. The common tendon from which the three muscles, viz. the adducent, abducent, and depriment, arise.
- g g g. Tendinous expansions arising from the ligamentum commune, going to their muscles.
- h. The abducent muscle.
- i. The depriment muscle.
- k. The adducent muscle.

FIGURE IV.

The superior oblique muscle.

- a. The optic nerve moved from its situation and inflected downwards, the better to shew the origin of the obliquus superior.
- b. The abducent muscle cut away.
- c. The interval between the heads of this muscle.
- d. The attollent muscle cut away near its commencement.
- e. The insertion of this muscle into the bulb of the eye.
- f. The levator palpebræ cut off.
- g. The adducent muscle cut away.
- h. The origin of the superior oblique muscle from the periostræum of the parietes of the internal part of the orbit.
- i. The tendon inflected through the trochlea.
- k. The trochlea.
- l. The tendon gradually dilated near its insertion.
- m. The insertion of the obliquus inferior.

FIGURE V.

The inferior oblique muscle.

- a. The bulb of the eye.
- b. The abducent muscle.
- c. The depriment muscle.
- d. The inferior oblique muscle arising from the anterior ora of the orbit.
- e. The insertion of this muscle into the bulb of the eye.

PLATE XLVII.

FIGURE I. Represents the heart of a woman, with its contiguous vessels injected with wax from the right side, in its natural situation.

- A. The whole of the *inferior vena cava*, that is annexed to the right auricle and diaphragm. It lays upon the diaphragm on its plane side, with the apex of the sixth rib towards the cartilage of the left side.
- B. The *superior vena cava* inserted into the right auricle; its branches are The right and left subclavian. The external jugulars receive The internal jugulars receive
- C. The *right auricle*, resembling in some degree an horse's ear, from which it received its name. The name of *auricula* is applied to the two cæcal serrated sacs. To the remaining cavity of the atria the denomination of *sinus* is applied.
- D. The *right ventricle of the heart*. It is called with propriety the *anterior*; it is much weaker than the other.
- E. A *portion of the right auricle*, to be seen in this situation of the heart which in form somewhat resembles a dog's ear. The auricles are connected by the means of membranes with the coronary veins to the heart.
- F. The *pulmonary artery* arises from the right ventricle of the heart. It is furnished with three semilunar valves arising from the heart; it divides into two branches.
- G. The *aorta* (or trunk of the arteries of the body) rising from the left ventricle between both auricles and the pulmonary arteries. The aorta, when scarcely out of the heart, emits coronary arteries; then, on the left side, towards the *spina dorsa*, it makes a great arch.
- H. The *posterior portion of the left auricle*. It is also called a sacculus of pulmonary veins.
- I. The *bronchial arteries of Ruysch*. They are distributed through the bronchial vesicles and the branches of the *arteria aspera*.
- K. The *coronary arteries and veins of the heart*, arise from the trunk of the aorta above the semilunar valves. Arteries are disseminated through the substance of the heart, and at length go into the veins of the heart.
- It receives the blood returning from all the inferior parts after the secretions are made.
- They receive the blood of the thorax. The frontal, angular, temporal, auricular, maxillary, and occipital veins, The lateral sinuses of the dura mater, the guttural and maxillary veins.
- It empties the blood received from the *vena cava* into the right ventricle.
- It protrudes the blood into the pulmonary arteries.
- The auricles are separated by means of a septum into the *right or anterior*, and *left or posterior atrium*. The septum in adults is shut, in the fœtus perforated.
1. The right pulmonary artery. 2. The left pulmonary ditto; they are distributed through the substance of the lungs.
- From the convex part of the arch come 1. The *arteria innominata*, from which the *right carotid* and *right subclavian*. 2. The *left carotid*. 3. The *left subclavian*.
- Four pulmonary branches go into the left sinus of the heart.
- They serve to nourish the lungs.
- The veins bring back the venous blood from the substance of the heart into the right auricle.

FIGURE II. Represents the same heart from the left side in the same situation of the body, as if it were beheld through the ribs.

- A. The *aorta*, arising from the left ventricle. The return of the blood prevented by the semilunar valves.
- B. Part of the *right ventricle* with the pulmonary artery. The pulmonary artery passing under the arch of the aorta, divides into two branches.
- C. The *left ventricle*, with the arteries and coronary veins. Constitutes the heart primitively, is less but stronger than the right ventricle.
- D. The *auricular part of the left auricle*. Adheres to the left side of the pulmonary artery.
- E. The greatest part of the *left auricle*. Is called a sacculus of pulmonary veins.
- F. The *capalis arteriosus* runs from the trunk of the pulmonary artery in the fœtus into the aorta. Moves the blood from the trunk of the pulmonary artery to the aorta.
- G. The greatest branch of the aorta. Descends towards the lower parts.
- Sends off arteries all over the human body.
- They proceed to the right and left lobes of the lungs.
- The orifice opening towards the atrium has only two mitral valves.
- Is seated on the left ventricle.
- The four trunks of the pulmonary veins are inserted in this auricle.
- Is closed in adults, and becomes a ligament.

PLATE LXVIII. *The circulation of the blood.*

The organs of the circulation of the blood.

The heart of a man is of a conical figure secundum axim perfectum.

The heart (G) adheres by the vena cava to the diaphragm.

The heart consists of four concave muscles, viz. two auricles and two ventricles, which receive the blood and immediately propel it.

A. The right auricle, filled with blood and irritated by its repletion to the motus instrumentalis begins to contract by constringing the ostia of either venæ cavæ.

B. The right ventricle, filled with blood and irritated to muscular contraction, expands its valvulæ tricuspidales (1.)

C. The pulmonary artery, compresses the blood by its elastic resiliion and stimulated tension, as well as by the relaxed capillary arteries.

The pulmonary veins, convey the blood received from the arteries to the left auricle.

D. The left auricle, filled and irritated by its repletion to the instrumental motion contracts itself.

E. The left ventricle, filled with blood, and irritated by its repletion to contract, expands its mitral valves (3.)

F. The aorta, and arteries of the body filled and expanded with blood, and irritated to contract, collect all their power at that time, composed of elastic resiliion and stimulated tension; and at once protrude the blood by the semilunar valves.

G. The inferior cava, it joins the heart with the diaphragm brevissimo tractu.

Are the heart and arteries.

In birds and brutes it resembles almost a perfect cone.

The whole of its flattened surface lies upon the diaphragm.

The cavities stimulated by their repletion contract; the valves prevent the return of the blood when received: the fibres being so disposed, that by their contractile power they send out the blood with great violence.

Then the muscular fibres stretched from the parietes of the auricle, elliptically surround each vena cava, which so closes both as to prevent the return of the blood into the veins.

The valves mutually compressed together entirely prevent the return of blood into the right auricle.

And by its first impetus compresses the semilunar (2.) valves at that time relaxed.

This takes place during the compression of the lungs in respiration.

And so constricts the ostia of the pulmonary veins, as to prevent the return of the blood into them.

(3.) The mitral valves so expanded and compressed with blood prevent the return of the blood into the left auricle.

The return of the blood into the ventricle is prevented by the valves being depressed.

Receives the blood from all the parts below the diaphragm.

By their power the blood is propelled into every part of the body.

It is the primary organ of the circulation.

During the motion of the diaphragm, the heart is either elevated or depressed.

The offices of the auricles are: that they should divide the blood, or its various particles, into just parts, by keeping its circulating course, &c.

The contraction of the auricle protrudes the blood into the right ventricle with a force sufficient to overcome the natural (not instrumental) contraction of the ventricle.

The contraction of the ventricle throws the blood into the pulmonary artery with a force equal to overcome the elastic power of that artery.

Thus the blood is prevented from returning into the ventricle, and is thrown into the pulmonary veins.

The blood is impelled into the left auricle, then relaxed with a force superior to the natural (not instrumental) contraction of the auricle.

The following contraction protrudes the blood into the left ventricle.

The following contraction impels the blood into all the arteries of the body, with an impetus superior to the elastic power of the arteries.

This protruding power throws almost an equal quantity of limpid and gross blood, collected from every part of the body, through the vena cava into the right auricle then relaxed.

Joined with the superior cava; it sends the blood into the right auricle.

The circulation of the blood, briefly considered, is as follows: The vena cava forces the blood into the right auricle of the heart, which discharges it into the left ventricle; from thence the blood is propelled to the pulmonary artery, and brought back by the pulmonary veins to the right auricle of the heart, which forces it into the right ventricle, and from thence it passes to the aorta, which by branches distributes the blood through the whole body. The blood is brought back to the vena cava from all parts by veins. All this has been indubitably proved.

PLATE XLIX. *Of the larynx and pharynx*

Figure I. Represents the remaining parts of the larynx, after cutting through the left side of the thyroid cartilage, with the muscles which are placed on the thyroid side, also those which are placed in the posterior part of the larynx. *a.* Anterior crico-thyroid ligament. *b.* Membrane which forms the lateral part of the glottis. *c.* Posterior crico-arytenoidæus. *d.* Lateral crico-arytenoidæus. *e. f.* A fasciculus from the interior and superior part of the thyroidea, arising not far from its suture, and inserted in the base of the arytenoidæa. *f.* The commencement from the thyroidea cut away. *g.* Thyro-arytenoidæus. *h. i. k.* A thin texture of cartilagineous fibres, which arising from the thyroid cartilage ascends near the exterior part of the origin of thyro-arytenoidæus. *h.* Through the exterior part of the thyro-arytenoidæus; then *i.* by the sides of the glottis to the epiglottis. *k.*—*l.* Descender of the epiglottis. *m.* Left oblique arytenoidæus. *n.* Right oblique arytenoidæus. *o.* Transverse arytenoidæus.

Figure II. Is the same texture of the cartilages of the larynx which is naked in Fig. I. with the muscles and membranes removed. *a. b.* Right part of the thyroid cartilage, the left of which is removed. *b. c.* Cricoid cartilage. *d. e.* Arytenoid cartilages. *e.* The little heads of the cartilages. *f.* Epiglottis.

Figure III. Represents the order of the muscles situated around the pharynx, seen from the posterior part. In order to show it better, besides the pharynx, the beginning of the œsophagus confined to it, and the neighbouring parts of the os hyoides, larynx, and aspera arteria, there is also added part of the head of the naked bone, to which the adjoining pharynx is added. *a.* Inferior part of the cranium. *b.* Styloid processes. *c.* Pterygoid processes. *d.* Os maxillare. *e.* Superior dentes molares. *f.* Inferior molares. *g.* Extreme cornua of the os hyoides. *h.* Hyothyroid ligaments. *i.* Arteria aspera cut off. *k.* Oesophagus cut off. *l.* Constrictores inferiores of the pharynx. *m.* Interior fibres of the œsophagus. *n.* Constrictores medii of the pharynx. *o.* Constrictores superiores of the pharynx. *p.* Circumflexi of the palatum molle. *q.* Stylopharyngei.

Figure IV. Exhibits the nearest view after removing the constrictor inferior of the pharynx. *a.* Naked membrane of the pharynx. *b.* Styloid processes. *c.* Naked membrane of the inferior part of the pharynx. *d.* Extreme cornua of the os hyoides. *e.* Hyothyroid ligaments. *f.* Thyroid cartilage. *g.* Cricoid cartilage. *h.* Aspera arteria cut off. *i.* Constrictores medii of the pharynx. *k.* Constrictores superiores of the pharynx. *l.* Levatores of the palatum molle. *m.* Circumflexi of the palatum molle. *n.* Palato-pharyngei. *o.* Palato-pharyngei. *p.* Posterior crico-arytenoidæus.

Figure V. Shews the nearest view upon removing the constrictor medius of the pharynx.—*a. b. c. d. e. f. g. h. k. l. m. n. o. p.* as in the preceding figure.

Figure VI. Upon removing the superior constrictor of the

pharynx, is seen *a. c. d. e. f. g. h. i. m. n. o. p.*—*q.* Hamuli of the pterygoid processes.

Figure VII. The interior of the pharynx. *a.* Posterior part of the pharynx and œsophagus cut off. *b.* Tubæ eustachianæ. *c.* Septum of the nares. *d.* Palatum molle with the uvula. *e.* Posterior arches of the palatum molle. *f.* Tonsils. *g.* Tongue. *h.* Epiglottis. *i.* Membranous sides of the glottis. *k.* Rimula of the glottis. *l.* Caputula of the arytenoid cartilage. *m.* Lateral ligament of the epiglottis. *n.* Ventriculi of the larynx. *o.* Hamuli of the pterygoid processes. *p.* Extreme cornua of the os hyoides. *q.* Hyothyroid ligaments. *r.* Thyroid cartilage. *s.* Cricoid cartilage. *t.* Aspera arteria cut off. *u.* Posterior part of the fistula laryngis. *v.* Lateral ligament of the epiglottis. *w.* Levatores of the palatum molle. *x.* Circumflexi of the palatum molle. *y.* Palato-pharyngei. *z.* Stylopharyngei.

Figure VIII. After removing the greatest part of the membrane covering the interior of the pharynx, are: *a.* The posterior part of the larynx cut off. *b.* Tubæ eustachianæ, or eustachian tubes. *c.* The concave of the nares. *d.* Ossa spongiosa. *e.* Septum of the nares. *f.* Hamuli of the pterygoid processes. *g.* Uvula. *h.* Tonsils. *i.* Tongue. *k.* Epiglottis. *l.* Membranous sides of the glottis. *m.* Caputula added to the arytenoid cartilages. *n.* Cricoid cartilage. *o.* Thyroid cartilage. *p.* Thyroid ligament. *q.* Extreme cornua of the os hyoides. *r.* Levatores of the palatum molle. *s.* Circumflexi of the palatum molle. *t.* Azygos uvulæ. *u.* Palatopharyngei. *v.* Stylopharyngei. *x.* Oblique arytenoidæi. *y.* Transverse arytenoidæus.

Figure IX. Most of the parts in the preceding figure are removed, by which others are seen. *a.* Posterior part of the pharynx cut off. *b. c. d. e. f. g. h. i. k. m. n. o. p. q.* as above in the preceding figure. *j.* The corpus teres like a ligament. *l.* Tendinous membrane which runs through the superior parts of the palatum molle coming from the nares. *r. u. w.* As in the preceding figure.

Figure X. Some parts which were represented in Figure VIII. are taken away, and those which are to be met with marked. *a. b. c. d. e. f. g. h. k. p. q. r.* as in Figure VII. *l.* External parietes of the pterygoid processes. *m.* The circumflexi of the palatum molle. *n.* Aponeuroses of the circumflexi. *o.* Parts of the constrictores superiores of the pharynx. *p.* Parts of the palatopharyngei. *q.* Stylopharyngei. *r.* Parts of the salpingo-pharyngei.

Figure XI. This follows behind the superior part of the preceding, after removing some of the parts. *a. b. c. d. l. m.* as in the above figure.

Figure XII. Represents the rectus, oris, and fauces, to shew the muscles, which, upon removing the investing membrane, belong to the palatum molle from this part. *a.* Gums. *b.* Tonsils. *c.* Posterior margins of the palatum molle. *d.* Fauces. *e.* Tongue. *f.* Constrictores isthmi of the fauces. *h.* Parts of the palatopharyngei.

The figures in this plate clearly represent the mechanical structure, &c. of those curious parts which perform deglutition, or swallowing; a great part of the organs of speech and sounds. Singing, &c. with all the various inflexions and delightful tones of the voice, as executed by the most excellent singers, is acquired by uncommon industry with apt organs. Musical sounds are received and impressed on the mind by the organ of hearing, but the imitation and performing various tones by the voice, is the power of the mind acting on, and putting into particular motion the larynx, its muscles, &c. assisted by the tongue, teeth, lips, &c. The excellence of some in the divine art of singing will convince reflecting men, amongst other things, that human beings are as unequal in their muscular powers and organs, as in their intellectual and acquired faculties. Those, whose organs have not an aptitude in receiving impressions, and an active disposition to improve, can never become excellent.

PLATE L. *The organ of hearing.*

FIGURE I. *Represents the organ of hearing, somewhat greater than in its natural state.*

The ear is the organ of hearing; in which three cavities are to be considered, viz. external or outermost, middle and innermost.

a. Auris externa; contains the auricle and meatus auditorius. *b. The ala, or pinna*; is the highest arched part of the auricle. *c. Helix, capreolus*; external eminence of the margin. *d. Anthelix*; interior eminence parallel to the former. *e. Scappa*; a furrow between the above-mentioned eminences. *f. Tragus, hircus*; an eminence next to the temples. *g. Antitragus*; a prominence joined with a lobe. *h. Concha*; a cavity going towards the meatus auditorius. *i. Lobe*; a part of the auricle hanging downwards. *k. Part of the squamous temporal bone. l. Os petrosum*; contains the internal ear, or seat of hearing. *m. Extremity of the mastoid process. n. Styloid process. o. Sinus mastoidei*. The internal parts of the ear are contained in the petrous bone. *p. Meatus auditorius*; in it are hairs and ceruminous glands, the canal is tortuous, anteriorly cartilaginous; posteriorly osseous. *q. Membrane of the tympanum*; it is contained in a kind of sulcus in the osseous annulus; it is constructed of four laminae, viz. cuticle and cutis of the meatus auditorius, periosteum of the meatus, and periosteum of the internal cavity; above by a short tela cellulosa placed between these laminae. *r. The figure of the cavity of the tympanum* is irregular; the capacity of the cavity is increased by the cellulosa of the mastoid process: the interior paries is directly opposed to the membrane of the tympanum, in which there are two broad osseous foveae, or depressions, called fenestrae; anteriorly the cavity extends by a declining orifice into the tuba Eustachii, which behind opens into the fauces and infundibulum. *s. Chorda tympani. t. Officula auditus*; malleus incus, os orbiculare, stapes. *u. Canales semilunares*; superior, middle, inferior, they open into the vestibulum. *vv. Cochlea. x. Aqueductus Fallopii*; a canal extending from the labyrinth, inflecting in the petrous bone and patulous between the styloid process, contains a nerve. *y. Tuba Eustachiana*; a canal partly osseous and partly cartilaginous, extending to the palatum, and there patulous behind the tonsils; it may be relaxed or narrowed by its muscles; it serves for the admission of air and sound; when it is closed, or obstructed, the hearing is diminished, or abolished. *z. Apertura of the Eustachian tube.*

FIGURE II. *Malleus much larger than in its natural state.*

a. Malleus. b. Its head. c. The neck. d. The long crus runs out to the manubrium. *e. The short crus* goes to the mastoid cells. *f. The manubrium* runs between the laminae of the membrane of the tympanum, and between the periosteum of the tympanum and meatus auditorius, to the center of its membrane, which rises into the umbo.

FIGURE III. *Incus*; consists of a body and two crura: the os orbiculare is annexed to the longer crus.

a. Interior surface.

FIGURE IV. *Os orbiculare*; is connected on one side

with the long crus of the incus, on the other with the stapes, which is situated anteriorly at almost a right angle.

FIGURE V. *Stapes*: it adheres by its basis to the fenestra ovalis, and closes it by means of the membrane drawn round it; it has a muscle called stapedius.

FIGURE VI. *Officula*, in its own situation with the membrane of the tympanum, as they appear within the cavity, and above from the top of the left bone of the temples.

a. Malleus, its manubrium inserted in the membrane of the tympanum; the head is connected upwards with the incus by ginglinus; the short crus infiltrates membranose expansion to the cellulosa of the mastoid process. *b. Incus* adheres to the malleus and os orbiculare. *c. Os orbiculare* between the incus and stapes. *d. Stapes.*

FIGURE VII. *Cochlea twice as large as nature.*

a. Cochlea: is a conical canal around the osseous cone, called *mediolus*, two and half times revolved; it is divided into two cavities from the top to the bottom by a kind of spiral, very friable lamina; hence the cavities are called *scalae*, of which the anterior and rather narrow beginning from the vestibulum is called *scala vestibuli*; the other posterior and large commences from the fenestra rotunda, which is a little turned towards the tympanum, and is called *scala tympani*. The end of these *scalae* is at apicem of the *mediolus* just mentioned, in which place a slight sinus is excavated in modum *infundibuli*. In that place it becomes a spiral lamina, not with bone but with membrane; and the *scalae* on both sides open into it, which appear to communicate together in this place. *b. Canales semicirculares superiores. c. Fenestra rotunda*, situated inferiorly and posteriorly; above this fenestra there is a membrane from the periosteum of the tympanum and cochlea, and separates the cavity of the cochlea from that of the tympanum. *d. There is a superior and inferior fenestra ovalis*, which leads to the vestibulum, the stapes at its base lies upon this; this fenestra is closed by no peculiar membrane. *e. Foramen for the portion of the nervus durus. f. Scala tympani. g. Scala vestibuli.*

FIGURE VIII. *Labyrinthus*; to this head belong the internal cavities of the petrous bone: *canales semicirculares, &c.*

a. Cochlea. b. Labyrinthus superior. c. Labyrinthus medius. d. Labyrinthus inferior. e. Vestibulum; is the middle cavity between the cochlea and canals; the three semicircular canals open into the vestibulum by five different foraminula. *f. Scala vestibuli. g. Scala tympani. h. The entrance of the portion of the soft nerves* into the vestibulum. The labyrinth reflects the sound, by which the nerves more strongly vibrate.

FIGURE IX. *Section of the cochlea*, with the vessels of the membrane of the spiral lamina, which is taken away, except the uppermost part.

a. Scala vestibuli. b. Scala tympani.

FIGURE X. *Section of the cochlea*, which contains the foramen of the acoustic nerve.

PLATE LI. *Omentum.*

FIGURE I.

When the figures of the *omentum majus* alone, and the gastrocolicon part of it, are represented by the ancients, as in *Garenges's Splanchnologia*, tom. vi. which exhibits the *omentum minus*, or *little omentum*. This has no exact limits, and does not appear according to nature; it will not be useless, therefore, to give another figure, as likewise another description.

A A. The hollow reclined part of the *liver*, so that the margin which was inferior is anterior, and the anterior, is now, superior. B B. *Vesicula fellea*, or gall-bladder, is commonly shorter in young subjects than the liver. C. *Vena et fossa umbilicalis*. D. *Lobulus*, improperly so called by *Spilegius*, whose eminence is pellucid through the little omentum. E. *Stomach*, the anterior curvature of which especially appears, but covered with bullæ of the inflated omentum. F. *Arteria et vena gastro-epiploica dextra*. G. The seat of the *annulus pylorus*. H. The apex of the *lien* projecting anteriorly into the cavity of the omentum, placed between the stomach and intestinum colon. I. *Ligament* which sustains the spleen, different from the other, not annexed to the lien but moving freely, which is, for the most part, the sacrum seat of the left mesocolon, yet not unfrequently, rather of the transverse, annexed to the peritonæum to the seat of the tenth, eleventh, or twelfth rib; to this ligament the omentum emits itself, yet, for the greater part, it is white and firm, and the transverse situation of the spleen arises, especially from that vinculum. K. *Omentum majus*, commonly called *gastrocolicum*, the terminations of it are; the superior and anterior from the whole curvature of the stomach, inferior and posterior from the greater part of the *transverse colon*; the inferior limit is, when the anterior *gastric lamina* meets with the *posterior colica s. this*, in children, is almost to the *umbilicus*, or navel; in adults it descends much lower, the fatter the person is, even to the pubis. The left end, as well as the middle part of the spleen, receives vessels as well as the ligament I. into which the omentum degenerates, as well as the colon. The right termination is with difficulty expressed by the line L. For the omentum either terminates the transverse ventricle, near the pylorus, or from the pylorus, never more to the right side; and from the accession of the *vasa gastroepiploica* vessels before the mesocolon, in which it innates, and runs to the colon by a descending right line, or one inclining obliquely to the left, and there, the sac of the omentum terminates. L. The line of separation of the omentum from the mesocolon. M. The origin of the *gastrocolic omentum* from the anterior curvature of the stomach, from which the anterior lamina goes out. N. *Conglobate glands*, in this line adjacent to the origin of the omentum. O. The line of the origin of the omentum

magnum from the intestinum colon: *s. lamina posterior*. P. Left end, or *fois caecus* of the omentum. Q. *Omentum minus* of *Winslow*, or a more incident membrane, which beginning is formed from a *fossa* of the ductus venosus, to the transito or passing of the hepatic artery, there continued to the membranes of the fundus of the hepatic vessels, which I have said, that the *transduodenum* hath continued to the mesocolon, degenerating in the end a little into the *Ligamentum hepatico œsophageum*, and passing the lobe of the liver, it innates itself into the minor curve of the stomach. In the cavity it has the lobulum, or little lobe, and the nudated lumbar glands. R. *Omentum colicum*, the perpetual appendix of the great omentum, which from the end of the colic line L. to even the end of the transverse mesocolon, and sometimes a little beyond, from the intestine colon, not having touched the stomach, from a double line, it proceeds, similar in magnitude equally lying loosely on the intestines, and, on the little lobe, it elegantly terminates. This said portion is not seen, which cedes to the great, so that it is larger than the smaller portion. In the entrance of the omentum, which the representation hath not admitted, some things are to be added to *Winslow's* description. There is an *hiatus*, or interval, which from a narrow beginning, and longish tract, between the biliary vessels and continued *vena portarum*, anteriorly situated, and between the posterior depressed lobe of the liver is received, which the hepatic vessels excavate, and which the ancients accounted, for a right *vena portarum*. Besides, a farther continued lunated hiatus to this way, discovered by *Winslow*, through which air can be equally admitted to the cavity of the smaller omentum; the extreme porta of the liver, which I have said from the opposite nearest to the inferior part, but distinct, is the ultimate radix of the mesocolon, which passing the pancreas, goes immediately forth to the descending duodenum; anteriorly, it is a fasciculus of the hepatic vessels, behind, the nudated peritonæum, smooth and equal. The *vena cava* lies to it a little to the right. S. Part of the mesocolon, between the right limit of the great omentum, and conjunction of the colon with the duodenum.

FIGURE II. *Pancreas.*

a. *Glands*, separate a peculiar juice. b. *Excretory ducts*, convey the juice from every gland into a common duct, called *ductus pancreaticus communis*. c. *Ductus pancreaticus*, from the ductuli running together through the middle of the pancreas, runs to the intestinum duodenum. d. The place where the pancreatic juice is mixed with the bile. e. *Osium*, where both liquors flow into the duodenum.

PLATE LII. *Of the omentum, &c. representation the second.*

All the former parts are exhibited; but with the greater omentum on both sides collapsed, and the colon drawn a little downwards, that the way to the concealed omentum might appear.

A A. The concave part of the *liver* reclined, that, what parts are anterior should be superior, or uppermost. From whence it follows, the gall-bladder naturally placed transversely, and its fundus anterior, its neck posterior, in a contrary manner to the common, is described.

B B. The gall-bladder, or *vesicula fellis*.

C. The umbilical vein, or *vena umbilicalis*. Here I add in the factus a much larger umbilical vein than *ductus venosus*, that the calculation of the *lumina* will be 629 to 100, and so, when the umbilical vein gives many branches to the liver, a great part of the umbilical blood is not immediately carried to the *ductus venosus*, but through the liver to the *vena cava*.

D. *Lobulus spigelii* through the smaller omentum pellucens, or visible, as in the former plate.

E F. The stomach almost empty, in the smaller curvature of which the *lobulus spigelii* enters, but plainly protecting anteriorly the left part of the liver.

G. The pylorus from which the first flexion of the duodenum ascends backwards.

K K. The *gastrocolicon omentum* collapsed. In this appears to arise singly from the stomach but not altogether, and not so from the duodenum, as many authors have asserted.

O O. The limits in the colon, from which the *gastrocolicon omentum* come forth.

Q Q. The smaller omentum, or *omentum minus*.

S S. Parts of the mesocolon, to the left, part of the second transverse duodenum appears pellucid, the right mesocolon from the top of the kidney, a little obliquely, ascends inwardly, covers the seat of the *vena cava*, and applies itself to the first duodenum, then to the pancreas, and rises anteriorly to the same duodenum again and comes through to the porta of the omentum, where from the fissure of the liver, with the vessels, comes to another associating root of the mesocolon, equally passing the duodenum goes to the colon, and likewise from the pylorus transversely under the stomach, through the whole latitude of the abdomen, and continued even to the spleen more manifestly an emerging lamina is followed anteriorly.

The inferior and similar transverse places itself to

this, free, and emerging to the duodenum, then a continuance of the external membrane of the rising jejunum, nearly joined to the mesenterium.

Between these two laminae is the whole pancreas, and all the duodenum, but more evidently the inferior part, the mesenteric artery, and its associating veins, and biliary ducts.

By inflation the internal receives air, and swells in bubbles, not dissimilar to the omentum.

T T T. Various parts of the colon.

Y. The second flexus, or bend of the duodenum, seated on the gall bladder, or *vesicula fellis*.

X. The third flexion of the duodenum, or the descending part in which the *ductus choledochus* inserts itself.

Y. Ligamentum, or membranes, which go from the gall-bladder in a continued transverse fulcus, passing the duodenum, to which they adhere to an external membrane, &c. These are said by Winslow to arise from the liver and gall-bladder, but terminate in the duodenum, and Monro, sen. calls a duplicature of the omentum; but it is, there, a simple, yellowish, and smooth membrane, a continuation of the capsula of Ellison, and to the minor omentum.

Z. a. The hepatic renal ligament, or of the peritonæum, from the kidney to the liver ascending, a double plica, or fold; Winslow thinks it the pancreatic ligament for the other side of its foramen. But this is the ultimate radix, or root of the mesocolon, which contains the duodenum, as in the former plate R. is seen.

Z. The left limits.

a. The right limits of this ligament.

b b. The right kidney covered with the peritonæum.

c. The meatus of the celebrated Winslow, between the *ligamentum hepaticocolicum* and *hepaticorenale*, as well as between the lobe of the liver and duodenum, and nearest the pancreas intercepted, a little drawn out, that it should appear to be lunated, and conflated about the liver. Rightly Winslow of this, but that this *hiatus* is longer continued, and that it goes between the liver and bile ducts, he hath not observed. Garengcot has given a rude plate in his *Splanchnolog.* T. vi. f. 1. which compare with ours.

d d. The colon with its pinguedinous appendix.

e e e. *Intestina tenuia*, or small intestines.

f f. Part of the pancreas, which insinuates itself between the flexures of the duodenum.

The two plates of the omentum, &c. are of some use in considering incised dropsies of the parts, as may be seen in my *Treatise on Swelled Legs, Dropsies, &c.* The first Figure in Plate LI. gives a clear representation of the gall ducts and pancreatic duct opening in the duodenum. This demonstration may serve to correct an opinion, common in the mouths of uninformed mankind, and even some medical practitioners, of bile generating in the stomach. No bile is ever in the stomach unless forced there by the inversion of the peristaltic motion of the duodenum, from whence bile may proceed into the stomach. When vomits are given by the ignorant, they frequently observe bile come up: but this bile, in general, is forced there from the duodenum by the vomit. On the injurious practice of giving vomits in what are called bilious complaints read my *Treatise on Nervous Diseases, &c.*

PLATE LIH. *Male parts of generation.*

FIGURE I. *Represents the bladder open on the anterior part; the prostate gland is divided above the corpora cavernosa; and the urethra is cut through all its length.*

<i>Name, situation, &c.</i>	<i>Connection, &c.</i>	<i>Termination, use, &c.</i>
a. <i>Vesica</i> , bladder, a membranaceous sacculus.	With the umbilicus, os pubis, intestinum rectum, and genitals.	Posteriorly in men to the intestinum rectum.
b. <i>Urachus</i> , above the bladder.	Is rarely hollow.	Goes to the liver.
c. <i>Aperture of the ureters</i> , with a duplicature of the internal membrane of the bladder.	Two membranous canals perforate the membrane of the bladder.	Carry the urine from the kidneys into the bladder.
d. Part of the bladder drawn to the side.		
e. <i>Caput Gallinaginis</i> .	Transmits the semen from the vesiculæ seminales.	Into the urethra.
<i>Vasa differentia</i> .	Are two on each side.	They carry the semen into the vesiculæ.
f. <i>Foramina</i> of the prostate ducts.	Emit the mucus of the prostate.	Into the urethra.
g. <i>Urethra</i> opening lengthways with the lacunæ.	Which lacunæ being irritated a greater quantity of mucus flows out.	The matter of gonorrhœa comes from these lacunæ.
h. <i>Prostate</i> cut off at the beginning of the urethra.	The prostate is a cordiform, glandulous, cavernous body.	Separating the mucus to be mixed with the semen.
i. The beginning of the <i>corpus cavernosum</i> with the musculus erector.	Is gradually produced from the bulb of the penis.	Forms the largest part of the penis.
k. The <i>corpus cavernosum</i> of the other side.	From the blood stagnating in the cellular texture.	The gland is distended; in this way erection of the penis is caused.
m. <i>Bulb</i> of the urethra.	Situated near the prostate.	From it the corpus cavernosum.
n. One of the <i>glands</i> of Cowper.	They are of the mucus kind.	Separate a lubricating humour.
o. Its <i>excretory duct</i>	Opens into the urethra.	The mucus lubricates the urethra.
q. The spongy texture of the <i>urethra</i> .	Through its whole length.	The urethra is very sensible.
r. <i>Fossa navicularis</i> .	The same as the orifice of the urethra.	Eliminates the semen and urine.
s. The <i>corpora cavernosa</i> open.	The blood driven into these bodies.	Produces rigidity.
t. <i>Glans penis</i> , is the anterior part of the urethra.	v. Part of the urethra where the incision is made.	x. Spongy texture of

FIGURE II. *Shows the posterior part of the bladder and inferior part of the penis.*

a. The <i>bladder</i> with the external membrane.	Receives the urine from the ureters.	And retains it.
b. <i>Ureters</i> and their insertion.		
c. <i>Insertion of the vasa deferentia</i> with the vesiculæ seminales.	c. <i>Vesiculæ seminales</i> .	d. <i>Vasa deferentia</i> .
f. <i>Gyr</i> of vesiculæ.	The semen is preserved in these vessels, and partly in the vesiculæ.	<i>Tabes</i> takes place from excessive profluvium of the semen.
g. <i>Ductus communis</i> to the vesiculæ and vasa deferentia.	The sperma is detained in them.	In them obstructions, &c.
h. <i>Prostate</i> without any involucri adheres under the neck of the bladder.	If the internal membrane of the urethra be inflamed this ostium opens.	Upon this duct being obstructed, congestion of semen, tumors, &c.
i. Membranous part of the <i>urethra</i> is often injured by injections.	The mucus is eliminated into the urethra about the caput gallinaginis.	Tumors and schirri of the prostate impede the emission of urine.
k. <i>Acceleratores</i> cut off to shew the spongy texture of the bulb.	The semen is thrown from the urethra by the action of the muscles.	Contraction of the fibres, calli, carunculae, ulcers, fungi, take place.
m. <i>Acceleratores</i> above the bulb.	<i>Caudæ of the acceleratores</i> terminating in the corpora cavernosa.	Incontinence of urine from the paralysis, or laxity of the muscles, impotence of the proper excretion, or only dropping guttatim.
n. <i>Tendo acceleratorum</i> .	p. Posterior part of the urethra.	
	q. Beginning of the corpora cavernosa with the <i>erectores</i> .	

FIGURE III. *Represents the testicle with the membrane called albuginea.*

r. Body of the testicle.	Separates the sperma virile, is compressed by the cremaster.	Carries the sperma into epididymis, which passes the semen into the vas deferens.
s. Epididymis lies upon the testes.	Receives the sperma from the testes.	
t. <i>Chorda funiculus spermaticus</i> , composed of artery, veins, nerves.	The spermatic artery and nerves descend through the abdominal annulus, or ring.	
u. Beginning of the vas deferens.	The vas deferens receives the semen from the epididymis.	And transmits it to the vesiculæ seminales, from whence it is thrown through the urethra in coition.
x. Vas deferens.		

P L A T E L I V.

FIGURE I.

- A. Inferior part of the abdomen and mons veneris.
- B B. *Labia pudenda* separated.
- C. *Clitoris* and *præpuce*.
- F. *Fossa magna*, or os externum.
- G. *Meatus urinarius*.
- H. *Perineum*.
- I. *Anus*.
- K. The part covering the extremity of the coccyx.
- L. The parts covering the tuberosity of the os ischium.

FIGURE II.

Section of the uterus and of the vagina of a girl of a few weeks.

- A. *Uterus* opens through the posterior sacies.
- B. *Ovaria* and tubæ fallopianæ.
- C. *Vagina* opening anteriorly.
- F. Its interior, nervous, rugous membrane.
- Δ. Its exterior, fibrous flesh.
- D. Circellus of the dissected *hymen*.
- E. Crenated and rough orifice of the uterus.
- F. *Septum* of the uterus composed of three juga.
- G. Anterior column of the cervix uteri.
- H. Posterior.
- I. Small valves of the cervix uteri.
- K. Valvulous part of the vagina nearest to the uterus.
- L. The anterior column of the vagina is largest.
- M. Posterior and less column.
- N. Intermediate caruncula.
- O. The nearest part of the hymen composed of circular valves.

The *mons veneris* is a fatty eminence covered with hairy skin, lying on the pubis.

Labia majora are two fatty eminences, beginning under the mons veneris, covering the labia minora, and running by the sides of the orifice of the vagina to the perineum, and there unite together by means of a transverse cutaneous fold, called *frenulum laborum*.

Labia minora, also called *nymphæ*, are two cutaneous folds like cocks gills, situated at the sides of the orifice of the vagina.

Clitoris is a glandiform particle, which adheres under the anterior commissure of the labia majora.

Hymen is a membrane mostly semilunar, which adheres to the orifice of the vagina in chaste virgins.

Vagina uterina is a membranous tube which begins within the minora, then ascends in the cavity of the pelvis between the ossa pubis and intestinum rectum to the neck of the uterus.

The *vagina* consists of three membranes.

The external is *cellular* from the tela cellulosa.

The middle *muscular* which consists of carneous fibres.

The internal, called *rugous*. These *rugæ* are transverse.

Urethra is a membranaceous canal, larger than the urethra virilis, and descending from the neck of the vesica urinaria within the ossa pubis, and opens by its orifice under the clitoris within the principia nymphaeum.

Uterus, or womb, is that spongyous receptacle which is situated in the cavity of the pelvis above the vagina, between the urinary bladder and intestinum rectum.

Its figure is like a compressed pear, hence

Its division into *bottom*, which is the highest and broadest part.

neck, which is the lowest part, narrowed to a point, and into

the *orificium uterinum*, which is the transverse rima in the neck of the uterus, which projects into the vagina.

Cavity of the uterus is small in a virgin, scarcely the size of an excoriated amygdala, with three apertures. Two are at the sides of the uterus, called the *orificia interna* of the fallopian tubes. The third aperture is below, viz. the *orificium uterinum*.

The broad ligaments of the uterus originate from the duplicature of the peritoneum, which gives the external membrane to the uterus. They are extended from the sides of the uterus to the ossa ilia; they sustain the uterus, tubæ, and ovaria.

The round ligaments of the uterus arise from the sides of the uterus sub fundo, go to the inguinal ring, and there terminate in fat.

Tubæ fallopianæ, are two membranaceous canals, which arise from the bottom of the uterus laterally, and run towards the ovaria in the superior margin of the broad ligament.

The ovaria are two plane bodies situated in the cavity of the pelvis at the sides of the uterus. Their exterior surface is fibrous, but their internal vesicular, at least, in virgins. These vesiculæ are called *ovula muliebria*, and disappear in the aged.

The glands of the genitals are:

1. *Glandule mucosæ vaginales*, which are situated under the rugous tunic of the vagina.
2. *Glandule odoriferæ* of the labia and clitoris.
3. *Glandule muciparæ urethræ*, which are found under its internal membrane.

The use of the parts of generation is for copulation.

conception.

nourishment of the fetus.

parturition.

menstruation.

In the thirty-fourth plate the urine bladder, uterus, and rectum, are seen laterally, and shew the exact space they fill up in the pelvis. This view ought to be well recollected in the practice of midwifery, and in the treatment of many female complaints, to account for causes, symptoms, &c. in various diseases. Patience in hard labours cannot be too strongly inclicated; for instruments are rarely, very rarely necessary, and, when used, generally tear the parts, so as to render future life truly miserable!

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